St. John's Law Review

Volume 95
Number 2 *Volume 95, Summer 2022, Number 2*

Article 3

The Science of Legal Synthesis

Jennifer M. Cooper

Follow this and additional works at: https://scholarship.law.stjohns.edu/lawreview

This Article is brought to you for free and open access by the Journals at St. John's Law Scholarship Repository. It has been accepted for inclusion in St. John's Law Review by an authorized editor of St. John's Law Scholarship Repository. For more information, please contact selbyc@stjohns.edu.

THE SCIENCE OF LEGAL SYNTHESIS

JENNIFER M. COOPER[†]

INTRODUCTION

This Article applies scientific research to improve and systematize legal synthesis, a vital element of reasoning that spans legal analysis, legal education, and law practice. Despite its critical role in legal analysis, synthesis is poorly understood, hard to perform, *and* even harder to describe.[1] Synthesis embodies a hidden curriculum that legal educators expect students to learn "by osmosis."[2] This lack of transparency frustrates both professor and student, rendering the skill difficult to teach, assess, and master.

This Article provides reliable methodologies to better understand how legal synthesis really works and how to actually perform it. Part I provides a high-level overview of the centrality of synthesis and inductive reasoning in legal analysis and a review of legal texts examining how legal synthesis is described and taught. Part II examines the science of synthesis, the role of categorization in inductive reasoning, and the research findings leading to greater inductive strength. Finally, Part III explains the mechanics of synthesis and proposes concrete, evidence-based recommendations for effective legal synthesis.

[†] Associate Professor of the Practice of Law, University of Denver Sturm College of Law. Special thanks to Richard Neumann, Nancy Leong, Mary Bowman, and Linda Edwards for extensive feedback. The author is grateful to the members of the Rocky Mountain Legal Writing Scholarship Group who read through several drafts and offered thoughtful critique as well as scholarship support from the Legal Writing Institute & We Write Retreat.

[1] Paul Figley, *Teaching Rule Synthesis with Real Cases*, 61 J. LEGAL EDUC. 245, 246 (2011) (explaining that law students have a difficult time grasping rule synthesis). *See also* Jane Kent Gionfriddo, *Thinking Like a Lawyer: The Heuristics of Case Synthesis*, 40 TEX. TECH L. REV. 1, 3 (2007) ("[N]ot all lawyers are able to synthesize well enough for sophisticated law practice. Some lawyers understand and use this skill intuitively but do not consciously think about the steps they actually take.").

[2] FREDERICK SCHAUER, THINKING LIKE A LAWYER: A NEW INTRODUCTION TO LEGAL REASONING xi (2009) ("In the typical law school, especially in the United States, the faculty believes that it teaches legal thinking and reasoning by osmosis, or interstitially, in the process of providing instruction in substantive subjects such as torts, contracts, criminal law, property, civil procedure, and constitutional law.").

Synthesis is critical to "thinking like a lawyer," but is as much art as logic.[3] Karl Llewellyn described "thinking like a lawyer" as "that out of the matching of a number of related cases it is your job to formulate a rule that covers them all in harmony, if that can be done . . . ."[4] Llewellyn was effectively describing "synthesis," a process of abstracting patterns and inducing generalizing principles from groups of legal authorities to create a unified idea representing and harmonizing the individual sources.

Legal education relies on teaching and learning through the data analysis of individual judicial opinions as worked examples.[5] Synthesis underlies the common law and all legal education, from contracts and torts to legal writing.[6] Yet law students and lawyers struggle to move beyond superficial, explicit text in judicial opinions to recognize patterns and structural relationships, to abstract, and to synthesize information into comprehensive generalized rules.[7] This Article embraces Frederick Schauer's call to better understand legal reasoning through cognitive science–the study of how people think.[8] While legal scholarship and texts

---

[3] Scott Brewer, *Exemplary Reasoning: Semantics, Pragmatics, and the Rational Force of Legal Argument by Analogy*, 109 HARV. L. REV. 923, 964 (1996). Brewer explains there is an art, as well as logic to analogy and art to logical proof. *See id.* The same inductive reasoning process used in developing analogies applies to the induction required for synthesis.

[4] KARL N. LLEWELLYN, THE BRAMBLE BUSH: ON OUR LAW AND ITS STUDY 52–53 (1951).

[5] ELIZABETH MERTZ, THE LANGUAGE OF LAW SCHOOL: LEARNING TO "THINK LIKE A LAWYER" 26 (2007) (discussing the use of the Socratic method in legal education); Laurel Currie Oates, *Did Harvard Get It Right?*, 59 MERCER L. REV. 675, 705 (2008) ("[L]aw students engage in analysis when they brief a case, identifying the key facts, the issue, the court's holding, and the court's reasoning, and they engage in synthesis when they prepare outlines.").

[6] *See* RUGGERO J. ALDISERT, LOGIC FOR LAWYERS: A GUIDE TO CLEAR LEGAL THINKING 9–12, 91 (3d ed. 1997). Aldisert explains that the abstraction of generalized rules from individual case examples is critical to common law legal analysis because it is highly unlikely that the same exact factual and legal issue will be replicated. *See also* SCHAUER, *supra* note 2, at 18–19. Schauer argues that reasoning with rules is a genuinely important part of law and legal reasoning and that it is often difficult for law students, lawyers, and judges to appreciate rules. *Id.*

[7] After spending many hours reading objective memos written by first-year, first-semester law students, I was frustrated by students' robotic parroting of explicit language from judicial opinions without nuance or depth and strings of case holdings passed off as "synthesis." Nor am I alone. Legal scholars have similarly observed law students' and lawyers' difficulty in synthesizing multiple cases and use of strings of cases as "synthesis." *See* Paul T. Wangerin, *Skills Training in "Legal Analysis": A Systematic Approach*, 40 U. MIAMI L. REV. 409, 443 (1986) ("When asked to formulate a legal argument based, for example, on four or five related cases, most students will simply talk about the cases one after another.").

[8] *See* SCHAUER, *supra* note 2, at 99.

explain processes for legal synthesis, these texts lack scientific theory or evidence-based methodologies for performing synthesis and evaluating whether it is effective.[9] To that end, this Article examines the science of legal synthesis from multiple, individual case examples,[10]—a process necessary for all legal analysis and writing[11]—and concludes with concrete, evidence-based recommendations for legal synthesis.

I. SYNTHESIS AND INDUCTIVE REASONING IN LEGAL ANALYSIS

"Reasoning is the central activity in intelligent thinking."[12]

Law is an intellectual discipline, considered by many to be a science[13] discernable through analysis of the raw data of cases, where the scientific tools of intellect are reasoning and argument.[14] "Logic[al reasoning] is the lifeblood of American law."[15] Thinking like a lawyer: the law's intellectual brand.[16]

---

[9] Gionfriddo, *supra* note 1, at 3 (discussing theory underlying synthesis, suggesting a charting and synthesis methodology, but omitting discussion about cognitive processes underlying synthesis).

[10] *See generally* RUTH ANN MCKINNEY, READING LIKE A LAWYER: TIME-SAVING STRATEGIES FOR READING LAW LIKE AN EXPERT (2d ed. 2014); Jane Bloom Grisé, *Critical Reading Instruction: The Road to Successful Legal Writing Skills*, 18 W. MICH. U. COOLEY J. PRAC. & CLINICAL L. 259, 269 (2017) (stating that legal analytical skills such as "case analysis, statute analysis, synthesis, and application [are] not possible unless students [can] *critically* read" legal materials).

[11] Edward H. Levi, *An Introduction to Legal Reasoning,* 15 U. CHI. L. REV. 501, 506 (1948) (describing synthesis as "the creation of a legal concept . . . as cases are compared"). *See* Edwin W. Patterson, *The Case Method in American Legal Education: Its Origins and Objectives*, 4 J. LEGAL EDUC. 1, 21 (1951); Wangerin, *supra* note 7, at 445 ("Traditional law school casebooks provide excellent resources for practicing the skill of using synthesis."). While it may discuss, in passing, other forms of logical reasoning used in legal reasoning, this article's focus is on induction and its role in synthesis.

[12] Jonathan St.B. T. Evans, *The Cognitive Psychology of Reasoning: An Introduction*, 46A Q. J. EXPERIMENTAL PSYCHOL. 561, 561 (1993).

[13] *See, e.g.*, MERTZ, *supra* note 5, at 1.

[14] This article focuses on reasoning, not argument. *See* Nelson P. Miller & Bradley J. Charles, *Meeting the Carnegie Report's Challenge to Make Legal Analysis Explicit–Subsidiary Skills to the IRAC Framework*, 59 J. LEGAL EDUC. 192, 199 (2009) ("Law practice is intellectual."). *See also* Brewer, *supra* note 3, at 926.

[15] Ruggero J. Aldisert, Stephen Clowney & Jeremy D. Peterson, *Logic for Law Students*: *How to Think Like a Lawyer*, 69 U. PITT. L. REV. 1, 1 (2007) (footnote omitted).

[16] *See* Kurt M. Saunders & Linda Levine, *Learning to Think Like a Lawyer*, 29 U. S.F. L. REV. 121, 122 (1994); Wangerin, *supra* note 7, at 429–31 (" '[T]hinking like a lawyer' means mastering six distinct and specifically definable skills . . . [that] revolve around the use of facts, statutes, synthesis, analogies, policy, and apparent contradiction.").

Legal literature primarily studies three types of reasoning—deductive, inductive, and analogic[17]—and focuses primarily on deductive[18] and analogic reasoning,[19] largely ignoring inductive and other types of non-logic-based reasoning.[20] Most legal scholars agree that analogic reasoning is inductive in nature, despite disagreement and confusion about the relationship between analogy and induction.[21]

The syllogism is the best-known paradigm of deductive reasoning: state a major premise, then a minor premise, and draw a conclusion from the premises.[22] The major premise must be a true statement, the minor premise must be a true statement; the conclusion, therefore, is proved to be true.[23] A valid syllogism transfers the truth of the premises to the conclusion. Deductive reasoning allows one to reason from broad to specific, from major premises to draw narrow conclusions.[24] A well-known syllogistic example states: All men are mortal (major premise). Socrates is a man (minor premise). Therefore, Socrates is mortal (conclusion).

---

[17] Brewer, *supra* note 3, at 926. The reasoning methods that "do the Law's work" are induction, deduction, abduction, and analogic reasoning. *Id.* Brewer's article draws on work in jurisprudence, language, philosophy, logic, and epistemology. *See also* Evans, *supra* note 12, at 561–62.

[18] Brewer, *supra* note 3, at 943; Evans, *supra* note 12, at 562.

[19] Legal reasoning is most closely associated with reasoning by analogy. Dan Hunter, *No Wilderness of Single Instances: Inductive Inference in Law*, 48 J. LEGAL EDUC. 365, 365 (1998) ("[M]ost works on legal reasoning focus on deductive or analogical inference."). Analogical reasoning requires the comparison of precedent with a new legal situation, in a direct case-by-case comparison of facts to predict an outcome. Frederick Schauer, *Why Precedent in Law (and Elsewhere) is Not Totally (or Even Substantially) About Analogy*, 3 PERSP. ON PSYCHOL. SCI. 454, 456 (2008) ("The legal system, like reasoning generally, frequently uses analogies with previous decisions to inform or assist current decisions. But the legal system, like decision making generally, often also uses a method of decision making in which the decision makers are expected not just to use past decisions to help them make better ones now, but to follow past decisions even when the decision makers believe those decisions are mistaken.").

[20] Hunter, *supra* note 19, at 367. Types of reasoning include rule-based, analogical, policy-based, principle-based, custom-based, inferential, narrative, etc. *See* LINDA H. EDWARDS, LEGAL WRITING AND ANALYSIS 53–60 (5th ed. 2019).

[21] Hunter, *supra* note 19, at 393 (noting that Golding and Posner argue that induction and analogy are the same but differ on which reasoning dominates and which is subservient).

[22] *Id.* at 365; Aldisert, Clowney & Peterson, *supra* note 15, at 2–4 ("Deductive reasoning, as Aristotle taught long ago, is based on the act of proving a conclusion by means of two other propositions."). Aldisert and his co-authors estimate that 90 percent of legal issues are resolved by deduction. *Id.* at 2.

[23] *Id.* at 4.

[24] *Id.* at 10.

Deductive reasoning can be expressed syllogistically even when parts of the syllogism are not expressed. When the "premise or conclusion is obvious," it may be omitted, leading to an enthymeme.[25] Deductive reasoning is useful in legal analysis when reasoning from a known rule—a statute or clearly defined common law rule or policy.[26]

Inductive reasoning, the mirror opposite of deductive reasoning, allows one to use specific observations to draw broad generalizations in creating a rule.[27] Unlike deductive reasoning, which requires a broad rule to initiate reasoning, inductive reasoning allows one to reason in the absence of a well-defined rule, from specific to broad: abstracting individual examples into broader categories based on unifying principles and similarities, observing patterns in the individual data, inducing generalizations, and inferring a broad explanation or rule.[28]

"[I]nduction is central to human reasoning" and a critical higher-level cognitive function of the human mind, requiring a more complex cognitive process than deduction.[29] Unlike deductive reasoning, which leads to irrefutable conclusions, inductive reasoning is inherently uncertain and probabilistic, only logically sound to the extent which, given the premises, the inferred conclusion is *credible* according to the evidence.[30]

---

[25] *Id.* at 8.

[26] STEVEN J. BURTON, AN INTRODUCTION TO LAW AND LEGAL REASONING 43 (3d ed. 2007).

[27] Hunter, *supra* note 19, at 369 ("Induction is, generally, the process of taking a number of specific cases or instances, classifying them into categories according to relevant attributes and outcomes, and deriving a broadly applicable rule from them.").

[28] We take isolated experiences and explain them with a general rule that covers the instances. This is often referred to as inductive generalization, which is the formation of a general rule from patterns in data. *See* Dan Hunter, *Reason Is Too Large: Analogy and Precedent in Law*, 50 EMORY L.J. 1197, 1207–08 (2001).

[29] Hunter*, supra* note 19, at 365, 367. The study of induction has a long history rooted in philosophy with the "best-known analysis" in Hume's critique of inductive reasoning as weaker than deductive reasoning, arguing there is little to "no basis for establishing the validity of a method for drawing inductive inferences." Evan Heit, *Properties of Inductive Reasoning*, 7 PSYCHONOMIC BULL. & REV. 569, 570 (2000). "[P]sychological research . . . paint[s] a somewhat more optimistic picture," finding that inductive reasoning is not only "widespread in human thought," but that humans naturally and organically "perform [inductive] reasoning very systematically." *Id. See also* A TAXONOMY FOR LEARNING, TEACHING, AND ASSESSING: A REVISION OF BLOOM'S TAXONOMY OF EDUCATIONAL OBJECTIVES 294 (Lorin W. Anderson et al. eds., complete ed. 2001) ("Deduction involves breaking a whole into subparts, evaluating them, and determining whether criteria are met. Induction, on the other hand, involves finding things that could fit together, judging their appropriateness, and assembling them to best meet criteria.").

[30] Aldisert, Clowney & Peterson, *supra* note 15, at 13.

Whereas syllogistic, deductive reasoning is formulaic and exact, inductive reasoning cannot be absolute because the conclusions are probabilistic, but they cannot be "guaranteed to be correct."[31]

Nevertheless, legal reasoning relies on probabilistic, inductive reasoning methodologies such as categorization, similarity judgments, and probability judgments.[32] Legal scholars describe induction as "a centerpiece of scientific reasoning [that] looms large in the generalizations on which lawyers and judges rely in legal argument."[33] *Inductive generalization* is the scientific term describing the generalization of rules from particular cases, where a rule or type of argument features premises based on specific examples and the conclusion "states a probabilistic generalization" inferred from the specific examples.[34]

Inductive generalization, the scientific term for synthesis, is necessary in the absence of clear rules to create or generate a rule from multiple individual cases or recognize patterns in the law. Such a synthesized rule is induced from a line of cases and becomes a major premise from which a conclusion may be deduced in future cases.[35]

Analogies are "familiar" and "ubiquitous" in legal reasoning.[36] Analogic reasoning is less concerned with rule generation and more concerned with comparative reasoning in legal analysis, allowing one to reason from specific to specific—to compare and contrast individual features of examples to predict a result based on similarities and differences.[37] In law, we reason that because a current situation is similar to a past situation, the current situation should result in the same outcome.[38] Some critics suggest analogic analysis is the "least well understood and explicated form of reasoning"[39] and that analogic analysis relies on "surface" similarities without considering policy or underlying purposes of the law.[40] Despite this criticism, analogic reasoning remains central to legal thought.

---

[31] *Id.* (emphasis omitted).

[32] Hunter, *supra* note 28, at 1207–08.

[33] Brewer, *supra* note 3, at 945.

[34] *Id.* at 944; ALDISERT, *supra* note 6, at 91.

[35] ALDISERT, *supra* note 6, at 10.

[36] SCHAUER, *supra* note 2, at 85; Cass R. Sunstein, Commentary, *On Analogical Reasoning*, 106 HARV. L. REV. 741, 741 (1993).

[37] SCHAUER, *supra* note 2, at 85–86.

[38] Aldisert, Clowney & Peterson, *supra* note 15, at 17.

[39] Brewer, *supra* note 3, at 926.

[40] Richard A. Posner, *Reasoning by Analogy*, 91 CORNELL L. REV. 761, 765 (2006) (book review).

Inductive generalization—that is, synthesis—is often confused with reasoning by analogy. While both follow an inductive process, "induction requires the generalization of a rule," whereas analogy attempts to predict an outcome based on individual similarities, or lack thereof, rather than generalizing or synthesizing overarching principles.[41] While deduction leads to certainty, induction and analogy lead to probability, yet are still uncertain.[42] Inductive reasoning identifies relationships and, based on those relationships, predicts probabilities instead of guarantees.[43]

This Article focuses on inductive analysis, rather than analogic analysis. As such, the information in the following table provides a very brief overview and distinction among reasoning types.

Descriptions of Reasoning[44]		
Type	***Process***	***Conclusion***
Deductive	General Rule → Specific Examples Top → Down	Certainty, conclusive
Inductive	Specific Examples → General Rule Bottom → Up	Probability, predictive
Analogic	Specific Examples → Specific Examples Side → Side	Probability, predictive

The legal system's normative order, informed by the rule of law, "aspires to be rational in significant ways."[45] This Article focuses on the inductive process of generalizing rules of law from multiple, complex sources of information that are logical and rationally sound. This is the process of synthesis in legal analysis.

Synthesis is necessary in legal analysis to formulate rules of law, especially when rules are not explicitly stated. Legal analysis depends on the clear, precise articulation of a "rule . . . of law" before application of law to facts to predict a result or craft a

---

[41] Hunter, *supra* note 28, at 1207–08.

[42] *Id.* at 1209.

[43] *See id.* at 1208; Jonathan St. B. T. Evans, *Questions and Challenges for the New Psychology of Reasoning*, 18 THINKING & REASONING 5, 13 (2012).

[44] Evans, *supra* note 43, at 13.

[45] Brewer, *supra* note 3, at 929.

persuasive argument with rational force.[46] The "common-law method" aspires to " 'reach[ ] what instinctively seem[s] the right result in a series of cases, and only later (if at all) enunciating the principle that explains the patterns—a sort of connect-the-dots exercise.' . . . 'Connecting the dots' is but a shorthand way of describing inductive reasoning."[47]

The normative process of legal analysis is as follows: state the applicable rule of law,[48] explain how the rule evolved or is applied,[49] and apply the rule to the facts of a new case to support a conclusion. When the rule is explicitly stated in a statute, an enacted law, or a case rule, the deductive reasoning process is relatively simple.[50]

More often, the rule is less explicit and left to the reader to decipher. Frederick Schauer described the difficulty in legal reasoning created by implicit rules:

> The court states the rule of law on which it bases its decision, applies the rule of law to the facts before it, and announces a result. That is the holding. The problems come when a court does not explicitly say what its holding is and leaves it up to readers of the opinion to try to determine it.[51]

---

[46] DAVID S. ROMANTZ & KATHLEEN ELLIOTT VINSON, LEGAL ANALYSIS: THE FUNDAMENTAL SKILL 21 (2d ed. 2009); *see also* DAVID S. ROMANTZ & KATHLEEN ELLIOTT VINSON, LEGAL ANALYSIS: THE FUNDAMENTAL SKILL 20 (1st ed. 1998) [hereinafter ROMANTZ & VINSON, First Edition] ("The initial step in legal analysis is to identify what rules apply to a particular legal issue.").

[47] ALDISERT, *supra* note 6, at 8–9 (footnote omitted).

[48] *See, e.g.*, HELENE S. SHAPO ET AL., WRITING AND ANALYSIS IN THE LAW 120–51 (7th ed. 2018); RICHARD K. NEUMANN, JR. & SHEILA SIMON, LEGAL WRITING 119 (2d ed. 2011) (explaining that to prove a conclusion of law, you must state: the conclusion, primary rule, rule explanation, rule application, restate conclusion); ROMANTZ & VINSON, First Edition, *supra* note 46, at 19 ("Rules are important because they provide the framework for legal analysis. . . . Rules include statutes, constitutions, treaties, ordinances, and regulations. Rules are also derived from judicial decisions.").

[49] Sometimes stating an explicit rule from a statute as the applicable rule of law is sufficient. However:

> When the intent and the scope of the law are more complicated, however, you may need to write a much longer explanation clarifying its meaning or components. These explanations may require you either to[:] analyze the language of a constitution or statute, set out the tests governing a law's application, or summarize a court's discussion of that rule or a pertinent discussion in a secondary authority, which has, perhaps, been adopted in that jurisdiction.

SHAPO ET AL., *supra* note 48, at 124.

[50] Aldisert, Clowney & Peterson, *supra* note 15, at 2 ("Perhaps 90 percent of legal issues can be resolved by deduction . . . ."); *see also* Gionfriddo, *supra* note 1, at 10–12. Statutes are explicit statements of a rule.

[51] SCHAUER, *supra* note 2, at 55.

When the controlling rule is not explicitly stated, but instead implied by the court's selection of facts, reasoning, and holding, the reader must *read between the lines* to extract and articulate the invisible rule from the case.[52]

What the court decided is typically apparent from the disposition—the appellate court affirms, denies, remands, and so on. But the *why* is often invisible and quite difficult to discern. When the court fails to explain *why* the facts are material to the outcome, the facts become subject to multiple interpretations on multiple levels of abstraction and create difficulties in identifying the level of abstraction or level of generality that expose *why* the court decided the *what* the way that it did.[53] This Article is concerned with this science of synthesis—extracting patterns and structural similarities—to derive rules of law when the reasoning is implied.

Schauer uses a well-known example of legal synthesis from Justice Cardozo's opinion in *MacPherson v. Buick Motor Company* to illustrate abstraction of structural similarities and resulting synthesis in deriving a rule of law covering liability for inherently dangerous products.[54] In *MacPherson,* the plaintiff, Donald MacPherson, purchased a Buick automobile from a car dealer, who had purchased the vehicle from the manufacturer, the Buick Motor Company.[55] One of the car's wooden wheels was defective and failed, collapsing the car and injuring the plaintiff.[56] The Buick Motor Company had purchased the defective wheel from

---

[52] CHRISTINE COUGHLIN ET AL., A LAWYER WRITES: A PRACTICAL GUIDE TO LEGAL ANALYSIS 102–04 (3d ed. 2018) ("As you research the law, you will look for [governing] rules—both broad and narrow . . . . The rules will likely come from two places: statutes and case law. Sometimes a statute or case law will clearly state the rules that govern the element or factor you are analyzing. Those rules are called explicit rules. Other times, however, finding the relevant rules requires you to sift through case law and synthesize a rule. Those rules are called implicit rules."). Coughlin explains that there are three typical circumstances in which an attorney might derive an implicit rule—that is, synthesize a rule from a series of authorities—(1) "[f]inding an implicit rule from consistent decisions"; (2) "[f]inding consistency in seemingly inconsistent cases"; and (3) "[b]ringing parts together to form a whole." *Id.* at 104–07. Gionfriddo explains the process of synthesis when ideas are implicit in a group of cases. *See* Gionfriddo, *supra* note 1, at 13–16 (stating that one must read between the lines to extract or articulate an implied or invisible rule to begin the inductive generalization required to synthesize a rule); *see also* SCHAUER, *supra* note 2, at 55.

[53] SCHAUER, *supra* note 2, at 50–53.

[54] *Id.*; 217 N.Y. 382, 394 (1916).

[55] *MacPherson*, 217 N.Y. at 384.

[56] *Id.* at 384–85.

another manufacturer and was unaware of the defect.[57] Judge Cardozo reasoned that Buick Motor Company could have discovered the defects in the wheel by reasonable inspection.[58]

Despite little natural similarity between Buicks, poisons, and exploding coffee urns, Cardozo synthesized a rule based on structural similarities, or *relevant similarity*, shared by these inherently dangerous products. In *MacPherson*, Judge Cardozo begins his synthesis by reviewing not cases involving other faulty vehicles, but cases involving other "dangerous" products, such as mislabeled poison,[59] a manufacturer's defect in a balance wheel for a circular saw,[60] improperly constructed scaffolding which collapsed and injured a painter,[61] and an exploding commercial coffee urn.[62] Cardozo abstracted the category to "poisons, explosives, and things of like nature, to things which in their normal operation are implements of destruction. If the nature of a thing is such that it is reasonably certain to place life and limb in peril when negligently made, it is then a thing of danger."[63]

Law students and lawyers[64] struggle to extract and synthesize rules from individual cases with implicit holdings and disparate facts, to formulate rules that "cover[ ] them all in harmony," as Professor Llewellyn suggested.[65] Synthesis falls into the hidden curriculum of law schools, one that professors expect students to either know inherently or figure out on their own "by osmosis."[66]

---

[57] *Id.*

[58] *Id.* at 385, 394.

[59] *Id.* at 385.

[60] *Id.* at 386.

[61] *Id.*

[62] *Id*. at 386–87.

[63] *Id.* at 389.

[64] Wangerin, *supra* note 7, at 443 ("For some reason, the creation of synthesis seems to be surprisingly difficult for most students, and, for that matter, for most lawyers."); Gionfriddo, *supra* note 1, at 3 (explaining that not all lawyers synthesize effectively for "sophisticated law practice," either for lack of skill in executing the steps or for lack of understanding of the value or methodology).

[65] LLEWELLYN, *supra* note 4, at 52.

[66] SCHAUER, *supra* note 2, at xi ("In the typical law school, especially in the United States, the faculty believes that it teaches legal thinking and reasoning by osmosis, or interstitially, in the process of providing instruction in substantive subjects such as torts, contracts, criminal law, property, civil procedure, and constitutional law."). The "[h]idden [c]urriculum" was a concept first utilized by sociologist Philip Jackson to describe messages, information, or skills students gain through the experience of school not explicitly or formally taught. David M. Moss, *The Hidden Curriculum of Legal Education: Toward a Holistic Model for Reform*, 2013 J. DISP. RESOL. 19, 22; *see also* Lara Freed & Joel Atlas, *A Structural Approach to Case Synthesis, Fact Application, and Persuasive Framing of the Law*, 26 PERSPECTIVES 50, 50 (2018).

Law students may be introduced to synthesis in a legal writing class, yet fail to transfer the skill to other domains, such as torts or contracts,[67] or to appreciate the need to outline, abstract, and synthesize structure of the law, instead focusing on the details of each individual case example.

Law school casebooks are filled with "hard" cases at the margins of the law.[68] When "an issue of law is unsettled" and no clear precedent or rule provides a major premise, then syllogistic, deductive reasoning is no help at all, and inductive reasoning and synthesis is one's only hope.[69] Synthesis is critical to the legal analysis necessary for thinking like a lawyer. In light of its importance and inherent complexity, one would presume that the process itself is painstakingly examined and broken down for novice legal writers. Yes and no.

Most legal texts explicitly discuss synthesis in some form.[70] Many legal scholars and texts discuss the use of case charts as a tool to collect information from individual cases—issues, facts, reasoning, and holding—and observe patterns for synthesis.[71] Although most legal texts describe the need for synthesis, very few identify the science of synthesis in any meaningful depth. One of the most comprehensive discussions of synthesis describes the process as identifying similarities and abstracting common meaning from them, creating a rule that is logical and reasonable:

> Synthesis is the binding together of several opinions into a whole that stands for a rule or an expression of policy. By focusing on the reasoning and generalized facts that the cases have in common, synthesis finds and explains collective meaning that is not apparent from any individual case read in isolation from the others. A synthesis is plausible if it's logical, reasonable, and

---

[67] Oates, *supra* note 5, at 690–91, 717. The Langdell/Harvard case method of legal education helps law students engage in activities to analyze cases and problem-solve, but relying solely on the casebook method without other active learning activities or explicit instruction does not give law students an opportunity to use information in "environments [where] students [will] be using what they learned." *Id.* at 717.

[68] Aldisert, Clowney & Peterson, *supra* note 15, at 12.

[69] *Id*.

[70] This is not intended to be an exhaustive survey of every legal writing text, but rather representative samples from legal writing texts used in law schools in first-year legal research and writing courses, and how these texts teach, discuss, and explain the purpose and process of synthesis.

[71] *See* Gionfriddo, *supra* note 1, at 16; *see also* LAUREL CURRIE OATES ET AL., THE LEGAL WRITING HANDBOOK: ANALYSIS, RESEARCH, AND WRITING 81–83 (7th ed. 2018); Tracy McGaugh, *The Synthesis Chart: Swiss Army Knife of Legal Writing*, 9 PERSPECTIVES 80, 80 (2001).

> consistent with public policy. A synthesis is more than a description of several cases, one after another.[72]

Other legal texts describe synthesis as "combin[ing] the language in the cases into one rule of law."[73] Describing synthesis as "combin[ing]" information[74] oversimplifies and underestimates the complex cognitive processes required to abstract, categorize, and generate rules, policy, or principles representing multiple legal authorities.

Legal texts generally describe the process of rule synthesis as follows:

(1) Read one case at a time,[75]

(2) Group cases according to holding/outcome,[76]

(3) Extract individual rules from each case, whether explicit or implicit,[77]

(4) Synthesize a general principle of law from the individual case rules,[78]

---

[72] NEUMANN & SIMON, *supra* note 48, at 57. An accurate description of synthesis without using "cognitive process" language describes the purpose for synthesis and explains why synthesis matters in this discipline.

[73] LINDA H. EDWARDS, LEGAL WRITING: PROCESS, ANALYSIS, AND ORGANIZATION 66 (7th ed. 2018); COUGHLIN ET AL., *supra* note 52, at 104 ("Synthesizing means combining principles stated in a series of authorities to form one rule."); *see generally* ALEXA Z. CHEW & KATIE ROSE GUEST PRYAL, THE COMPLETE LEGAL WRITER (2d ed. 2020).

[74] EDWARDS, *supra* note 73, at 66 ("You might be able to combine the language in the cases into one rule of law. This process is called 'synthesizing' or 'harmonizing' opinions.").

[75] SHAPO ET AL., *supra* note 48, at 69 ("Synthesizing is the step between your research and your writing. You do research by reading one case at a time.").

[76] *Id.* at 69–70. You will engage in one type of case synthesis when you group cases according to the rule they follow.

[77] NEUMANN & SIMON, *supra* note 48, at 35 ("When a court does not state a rule of the case, you might be able to formulate the rule by converting the determinative facts into elements of a rule.").

[78] The Neumann text explains the synthesis process as identification and extraction of commonalities:

> To turn a description of several cases into a unified synthesis, step back and ask yourself what the cases really have in common under the surface. Identify the threads that appear in [multiple] cases . . . , tie the threads together, and organize the analysis around the threads themselves—rather than around the individual cases.

Id. at 57. Neumann goes on to explain:

> When in your mind you develop or discover a synthesis, you'll usually do it from the bottom up: You'll work with the details of the cases (the bottom) until you see the threads that produce the synthesis (the top). But when you explain it in writing to your reader, you'll do the reverse. You'll start at the top by stating the synthesis and work your way down by explaining how the details support it.

(5) Test your synthesized rule.[79]

This Article next explores cognitive science to better understand and perform steps 4 and 5—the process of performing and evaluating synthesis.

II. THE SCIENCE OF SYNTHESIS

Synthesis is a complex higher-order cognitive process, described in Bloom's *Taxonomy* as requiring the abstraction of patterns or structures from individual elements to represent a well-integrated whole:

> [T]he putting together of elements and parts so as to form a whole. [Synthesis] is a process of working with elements, parts, etc., and combining them in such a way as to constitute a pattern or structure not clearly there before. Generally this would involve a recombination of parts of previous experience with new material, reconstructed into a new and more or less well-integrated whole.[80]

When synthesizing, one abstracts elements from many disparate sources, discovering structures or patterns not clearly visible before; this process yields a product that is more than the source materials yet represents the whole.[81] When Bloom's *Taxonomy* was revised, synthesis was renamed and incorporated into the higher-order thinking "Create" category—described as "putting elements together to form a coherent or functional whole," remaining at the highest order of thinking and cognitive processes.[82]

Synthesis is a complex cognitive process using inductive reasoning.[83] The inductive cognitive processes of synthesis have

---

Id. at 57–58.

[79] The Neumann text describes a necessary step to test the synthesized rule for realism: "The last skill is *testing the result of your reasoning to see whether it would seem realistic to the judicial mind*." *Id.* at 58. That test, however, is not really articulated, other than saying it requires experience to understand, or asking whether the reasoning "would be inconsistent with a judge's trained intuition." *Id.* at 58–59.

[80] BENJAMIN S. BLOOM ET AL., TAXONOMY OF EDUCATIONAL OBJECTIVES: THE CLASSIFICATION OF EDUCATIONAL GOALS 162 (1956). Bloom's Original Taxonomy consisted of six major categories arranged from lower order to higher order thinking: Knowledge, Comprehension, Application, Analysis, Synthesis, and Evaluation.

[81] *Id.*

[82] A TAXONOMY FOR LEARNING, TEACHING, AND ASSESSING: A REVISION OF BLOOM'S TAXONOMY OF EDUCATIONAL OBJECTIVES 84 (Lorin W. Anderson et al. eds., abr. ed. 2001).

[83] Hunter, *supra* note 19, at 369 ("Induction is, generally, the process of taking a number of specific cases or instances, classifying them into categories according to relevant attributes and outcomes, and deriving a broadly applicable rule from them.").

been studied extensively by cognitive scientists, philosophers, and logicians,[84] defining synthesis as *inductive generalization*.[85] People do not only rely on inductive reasoning to make inferences, predictions, and generalizations; they also perform inductive reasoning *systematically*. Cognitive science is the interdisciplinary, scientific study of the human mind and its processes—how the mind works, how we think and reason—and provides concrete, evidence-based guidance for abstracting general principles from groups of individual case examples.[86]

The next Section will analyze the processes required for synthesis. This discussion will briefly discuss categorization, a primary step in induction. The discussion of categorization is not intended to be exhaustive, but to provide a basic overview of the role of categorization in induction. This overview provides the foundation for the subsequent discussion of abstraction and induction of generalized rules from category members, which will be discussed in more detail below.

A. Categorization in Induction and Synthesis

> "If learned knowledge consisted merely of isolated facts with no generalization, then the knowledge would be useless except for the unlikely exact recurrence of the learned situation."[87]

People categorize everything: trees, animals, cars, exploding coffee urns, poisons, written language, and behavior.[88] Categorization is second nature in human conscious and unconscious thought and is the building block of the human

---

[84] Brewer, *supra* note 3, at 926. Brewer identifies this "greater methodological reciprocity between legal reasoning and other intellectual disciplines." *Id.* Methods associated with legal reason are also studied in natural and demonstrative sciences, such as math, logic, social science, and all play a vital role in legal reasoning. *Id.*

[85] Hunter, *supra* note 19, at 365. Hunter defines inductive generalization as the generalization of a rule from multiple individual cases. *Id.* at 365, 380.

[86] *See* Hillary Burgess, *Deepening the Discourse Using the Legal Mind's Eye: Lessons from Neuroscience and Psychology that Optimize Law School Learning*, 29 QUINNIPIAC L. REV. 1, 2 (2011).

[87] John K. Kruschke, *Category Learning*, *in* HANDBOOK OF COGNITION 183, 183 (Koen Lamberts & Robert Goldstone eds., 2005).

[88] *Id.* Cars are more like other cars, even differing models such as Toyotas and Ferraris, than cars are like trees. James A. Hampton, *The Role of Similarity in Natural Categorization*, *in* SIMILARITY AND CATEGORIZATION 13, 13 (Ulrike Hahn & Michael Ramscar eds., 2001).

cognitive process.[89] This conscious and unconscious information-sorting into discrete groups forms the building blocks of induction and synthesis; the process relies on inferences of unseen attributes from observable features, generalization, and classification of attributes into categories.[90]

The instinct to categorize and group objects, events, and information into discrete categories based on similarities, and to induce general principles based on properties of category members, is a frequent area of study in cognitive science.[91] Legal scholars have also recognized the critical role of categorization in law, legal theory, legal analysis, inductive reasoning, and analogy.[92] Information hierarchies and taxonomies rely on categorization to organize and abstract properties from individual objects to superordinate categories.[93] For example, scientists categorize information into taxonomies from the highest levels of domain and kingdom, down to subordinate levels of genus, species, and subspecies.[94]

Categorization is highly contextual and domain specific and requires induction of unifying similarities, outcomes, or properties to generalize a category from individual examples.[95] In the 1970s, researcher Eleanor Rosch developed the *prototype theory* of categorization.[96] Rosch's research rejected two commonly held

---

[89] Hampton, *supra* note 88. The idea that humans intuitively categorize everything "because we find them similar" seems "non-controversial, if not circular." *Id.* Humans "form categories of many different kinds in the course of everyday cognition." *Id.*

[90] Kruschke, *supra* note 87. Because inference of appropriate action is perhaps the fundamental goal of cognition, categorization and category learning are core research domains in cognitive science.

[91] Charles Kemp & Alan Jern, *A Taxonomy of Inductive Problems*, 21 PSYCHONOMIC BULL. & REV. 23, 29 (2014).

[92] *See, e.g.*, STEVEN L. WINTER, A CLEARING IN THE FOREST: LAW, LIFE, AND MIND 223–58 (2001); Karl N. Llewellyn, *A Realistic Jurisprudence—The Next Step*, 30 COLUM. L. REV. 431, 453–54 (1930); Mark L. Johnson, *Mind, Metaphor, Law*, 58 MERCER L. REV. 845, 845 (2007); Ronald Chen & Jon Hanson, *Categorically Biased: The Influence of Knowledge Structures on Law and Legal Theory*, 77 S. CAL. L. REV. 1103, 1131 (2004); Laura E. Little, *Characterization and Legal Discourse*, 46 J. LEGAL EDUC. 372, 373 (1996).

[93] Eleanor Rosch, *Principles of Categorization*, *in* COGNITION AND CATEGORIZATION 27, 30 (Eleanor Rosch & Barbara B. Lloyd eds., 1978). Rosch defines taxonomy as "a system by which categories are related to one another by means of class inclusion." *Id.*

[94] *Id.* The scientific categorization or taxonomic classification exemplifies inductive reasoning by classifying organisms from the domain and kingdom down to the genus and species level.

[95] *Id.* at 41–43.

[96] *Id.*

beliefs: that all category members are good examples of a category, and that categories are independent of outside influences.[97] Some items, which Rosch termed *prototypes*, are more representative of a category than others.[98] Birds like robins and blue jays are more *birdlike*, and therefore, more *prototypical* birds than ostriches, penguins, or emus.[99]

According to Rosch's prototype theory, categorization is an inexact process with fuzzy boundaries, rejecting the classical view that categories have clear, well-defined boundaries set by natural ideas of similarity and category membership.[100] Rosch's research on categorization critically informs later discussions of synthesis.

Categorization allows us to use knowledge about categories both to generate rules from category members and to understand individual category members themselves. In addition, "categorization occurs on different dimensions and at different levels of abstraction simultaneously."[101] Categorization allows one to "retain[ ] previously learned knowledge while quickly acquiring new knowledge,"[102] promoting cognitive economy—maximizing information gain with the least cognitive effort and minimizing cognitive load.[103] Categorical induction is essential for efficient learning and problem solving because individual examples fade more quickly in memory than rules developed from category members, proving we are more likely to remember a rule than the individual examples used to develop the rule.[104]

---

[97] *Id.*

[98] Eleanor Rosch, *Cognitive Reference Points*, 7 COGNITIVE PSYCHOL. 532, 544–45 (1975).

[99] Chen & Hanson, *supra* note 92, at 1151 n.183.

[100] *See* Rosch, *supra* note 98, at 544.

[101] Kruschke, *supra* note 87, at 184 ("For example, a cardinal (i.e. the bird) can evoke the color category red or the part category feather or the object category animal, and so on. Within [each category] there are levels of abstraction, such as scarlet, red or warm within the 'color' [category], or cardinal, bird or animal within the 'object' [category]."). The basic level of abstraction is that level of abstraction appropriate for using, thinking about, or naming an object. *Id.*

[102] *Id*. at 183.

[103] *See* Jacob Feldman, *The Simplicity Principle in Human Concept Learning*, 12 CURRENT DIRECTIONS PSYCHOL. SCI. 227, 227 (2003). This cognitive economy is related to working memory and cognitive load, also called complexity minimization in other cognitive science literature. *See id.*

[104] Douglas L. Medin & Lance J. Rips, *Concepts and Categories: Memory, Meaning, and Metaphysics*, *in* THE CAMBRIDGE HANDBOOK OF THINKING AND REASONING 37, 45 (Keith J. Holyoak & Robert G. Morrison eds., 2005).

Categorization serves critical cognitive functions in induction and synthesis in matching, sorting, grouping, and abstracting.[105] As will be discussed in more detail, similarity, typicality, and diversity of examples play critical roles across categorization, induction, and resulting synthesis.

B. Inductive Strength of Categories

> "[O]ne of the fascinating characteristics of human inductive inference is that people do not simply add up evidence from individual cases."[106]

Developing and abstracting relationships from objects is commonplace in human thought, but its regularity belies its complexity. Abstract relational thinking is a "late evolutionary development" in the frontal cortex, similar to higher order thinking such as executive function.[107] This Section discusses concepts highly relevant to synthesis: how we abstract individual objects to develop generalized rules and the inductive strength of categories themselves.

Similarity and diversity are critical to induction and inductive strength, a common theme that emerges across diverse disciplines such as cognitive science, philosophy, logic, and legal reasoning. Three research findings are critical to induction and synthesis. First, similarity and typicality of individual examples promote inference and categorization. Second, the number and diversity of individual examples within a category predict the inductive strength of synthesis within a category.[108] Third, some properties

---

[105] Hunter, *supra* note 19, at 396. Hunter describes inductive legal reasoning as taking multiple individual cases, categorizing them according to similarity based relevant attributes and outcomes, and deriving a general rule. *See id.* at 367–68. Hunter also notes the importance of categorization in statutory interpretation, *ejusdem generis*—"of the same genus"—which relies on inductive reasoning with the identification of the genus as the first step in the interpretive process. *See id.* at 392. This emphasis on categorization is described in legal scholarship and texts as sorting, matching, categorizing, grouping, and so on. It is also explicitly applied in the process of "case charting."

[106] Heit, *supra* note 29, at 576 (emphasis added).

[107] Leonidas A. A. Doumas & John E. Hummel, *Approaches to Modeling Human Mental Representations: What Works, What Doesn't, and Why*, *in* THE CAMBRIDGE HANDBOOK OF THINKING AND REASONING, *supra* note 104, at 73.

[108] While a large number of premises can be a reliable predictor of inductive strength, variability or diversity is also critical to inductive strength. Heit, *supra* note 29, at 577. The idea that "more variable observations promote broader or stronger generalizations, is now considered a truism in areas of research near to induction, such as categorization." *Id.* Heit's *Properties of Inductive Reasoning* reviews the main

shared by individual examples are more generalizable than others, depending on *relevant* similarity. Each will be discussed in more detail below.

1. Similarity and Typicality

Similarity is the most predictive indicator of inductive strength. The "observation that [an object] has a certain property promote[s] the inference that *something else* [also] has that property" when the objects share *similar* characteristics.[109] The similarity effect, the idea that commonalities in objects promote the inference of *additional* commonalities in those objects, spans multiple disciplines from philosophy to logic, legal theory, and cognitive science. Similarity as inference promoting is logical and relates back to the human instinct to categorize like with like.[110] Three factors consistently promote strong inferences from individual examples:[111] similarity between individual premises;[112] typicality of the premise to the conclusion category;[113] and homogeneity of the conclusion.[114]

Similarity is the most obvious and robust predictor of inductive strength and is the rule, not the exception.[115] We are more willing to project a property known to be true of crocodiles to alligators than from crocodiles to koala bears due to the pervasive power of perceived *similarity* of crocodiles and alligators. In a seminal study on inductive reasoning in 1975, researchers discovered that the more *similar* the premise was to the conclusion, the stronger the inference.[116] Subjects were asked to assume that all members of an animal species on a small, remote

psychological phenomena of inductive reasoning, covering twenty-five years of experimental and model-based research. *See generally id.*

[109] *Id.* at 570 (emphasis added).

[110] *Id.* at 576.

[111] *Id.*

[112] *Id.* at 569. Similarities between the premise and conclusion promotes strong inferences. *Id.* at 570.

[113] *Id.* at 570. The more typical premise categories are of the conclusion category, the stronger the argument. People are more willing to project from robins to birds than from penguins to birds because robins are more *typical* of the category *birds* than penguins. Medin & Rips, *supra* note 104, at 40.

[114] Heit, *supra* note 29, at 570–71. Novel, idiosyncratic qualities are unlikely to be widely projected to other examples. *Id.* at 589.

[115] Ulrike Hahn & Michael Ramscar, *Conclusion: Mere Similarity?*, *in* SIMILARITY AND CATEGORIZATION, *supra* note 88, at 257; Heit, *supra* note 29, at 571.

[116] Heit, *supra* note 29, at 571.

island had contracted a contagious disease.[117] The subjects were then told that all rabbits on the island contracted the disease.[118] Subjects were asked to predict what proportion of dogs would also have the disease.[119] Subjects were more likely to infer from rabbits to dogs than from rabbits to bears, due to greater perceived similarity between rabbits and dogs than betweenrabbits and bears.[120]

The more typical the premise items are of the conclusion category, the stronger the inference and rational force[121]—the more prototypical, the stronger the inference. This is consistent with Rosch's prototype theory. People are more willing to project a property from robins to birds than from penguins to birds because robins are prototypical birds and more *typical* of the bird category than penguins are.[122]

The more homogenous the category members are, the stronger the inference and rational force. People are less willing to project seemingly idiosyncratic properties to entire categories, but more willing to draw inferences from invariant properties to homogenous conclusion categories.[123] Researchers studied subjects' willingness to draw inferences to whole populations based on varying premises and sample sizes of individuals in the population.[124] For example, subjects were told that one member of a fictional island group, the Barratos, was obese and then were asked to project that premise of obesity to the entire Barratos population based on the obesity of only one member.[125] Subjects were unwilling to make strong inferences to the entire group based on a perceived idiosyncratic, individualistic trait.[126] But the more homogenous and invariant the property, the more subjects were willing to draw inferences to entire populations, even from a very small sample size.[127] In the example, the more members who were obese, the more subjects were likely to infer the characteristics to

---

[117] *Id.* Many early cognitive science studies focused on animals due to straightforward taxonomies, ordinate and superordinate structures, and hierarchies. *Id.* at 571–72.

[118] *Id.* at 571.

[119] *Id*.

[120] *Id.*

[121] *Id.* at 573.

[122] *Id.*

[123] *Id.* at 577.

[124] *Id.*

[125] *Id.*

[126] *Id.* at 589.

[127] *Id.* at 577.

the entire population.[128] Legal scholars recognize the similarity effect as a key step in the legal reasoning process in induction and abstracting general rules from individual cases.[129]

2. Numerosity and Diversity

Numerosity and *diversity* promote strong inferences from multiple cases. Greater numbers of diverse individual examples create fertile ground for inductive generalization and lead to stronger inductive generalization from a set of multiple examples.[130] Whereas similarity initially leads to categorization, *dissimilarity* through numerosity and diversity of examples within a particular category lead to stronger induction of rules and reliability of induced rules.[131]

Similarity is the gateway to synthesis, but numerosity and diversity are the glue. Though counterintuitive, both *similarity and dissimilarity* play important roles in the science of synthesis. When inducing information, we are typically faced with large amounts of conflicting information. Rather than just one example, there is often an extensive set of examples to rely on and consider.[132] Counterintuitively, combining two strong cases does not necessarily lead to a stronger inductive outcome.[133] A group of *weaker* cases can make a stronger unified whole.[134]

Numerosity is the number of the sample size, and leads to stronger inferences: the greater the number of examples, the greater the inductive strength.[135] Returning to the study about the fictional Barratos island group, researchers studied inferences about people and objects on a small island, yet systematically varied the number of observations.[136] Subjects were told that some members of the Barratos island group were obese and were then

---

[128] *Id.*

[129] *See* Levi, *supra* note 11, at 501–02; Brewer, *supra* note 3, at 932–33.

[130] Heit, *supra* note 29, at 576–77.

[131] *Id.* at 583–84.

[132] *Id.* at 570 (stating that compiling "a list of the most convincing, or induction-promoting, cases does not necessarily lead to the strongest possible ensemble of cases").

[133] *Id.*

[134] *Id.* ("The interesting result is that sometimes a set of individually weak cases can make a strong case together.").

[135] This is supported in the legal scholarship as well. Aldisert wrote that "[i]n generalization by enumeration, we can say that the larger the number of specific instances, the more certain is the resulting generalization." ALDISERT, *supra* note 6, at 92.

[136] Heit, *supra* note 29, at 577.

presented with varying numbers of sample sizes of these obese islanders, ranging from one, three, or twenty.[137] Subjects' inferences that *all* Barratos islanders were more likely to be obese substantially increased with greater sample size or numerosity.[138] Conversely, for more homogenous premises that are not as subject to variable conditions, such as obesity, a smaller sample size was sufficient for inductive strength.[139]

The more diverse the examples, the greater the inductive strength. Repeating the same or highly similar evidence is not more convincing than stating compelling evidence once.[140] Diversity, or the variability of individual examples, leads to stronger inductive capacity: the greater the diversity of examples, the stronger the induction.[141] While counterintuitive and more cognitively demanding, converging and conflicting evidence from different sources promotes stronger or broader inductive generalizations.[142] This finding that variable examples promote stronger generalizations is "now considered a truism" in areas of inductive research, such as categorization.[143]

The less similarity there is, the stronger the ultimate induction tends to be, even though this finding seems to contradict the similarity effect discussed previously. For example, people are more willing to conclude that "*all mammals* love onions" if "hippos and hamsters love onions" than if "hippos and rhinos do" because of the *lack of similarity* between hippos and hamsters compared to

---

[137] *Id.*

[138] *Id.*

[139] *Id.*

[140] This is also consistent with the legal reasoning literature that discusses the problems with too few examples/instances. ALDISERT, *supra* note 6, at 51 ("The force of an induced generalization by enumeration is measured by the *quantity* of instances."). Aldisert also specifically references numerosity in evaluating the strength of inducted rules. Aldisert explains the potential pitfalls of lacking sufficient numerosity: "the fallacy of hasty generalization," "a fallacious reasoning that seeks to establish a generalization by the enumeration of instances, without obtaining a representative number of instances," also known as "jumping to conclusions." *Id.* at 50, 92.

[141] Heit, *supra* note 29, at 577.

[142] *Id.* Researchers have found considerable evidence for diversity-based reasoning. *Id.* at 577–79.

[143] *Id.* at 577 (citation omitted) ("This result, that more variable observations promote broader or stronger generalizations, is now considered a truism in areas of research near to induction, such as categorization.").

hippos and rhinos.[144] This phenomenon has strong empirical support in multiple domains.[145]

When inducing from multiple cases, a more numerous and wider continuum of cases yields a more robust and logically sound generalization. This is also consistent across disciplines. For example, legal theory discusses the need for multiple, diverse examples to avoid the fallacy of the "hasty generalization," or jumping to conclusions.[146] Logicians and cognitive scientists agree that insufficient numerosity and non-diverse examples lead to illogical inferences.[147]

Simply assembling a list of the most "convincing" or induction-producing examples does not lead to the strongest *ensemble* of cases. A set of individually weak cases can make a strong rule as a whole, provided that those cases are consistent with numerosity and diversity principles. This is highly relevant for synthesizing rules capturing a wide diversity of factual scenarios. These findings provide specific tools supported by cognitive science literature on inductive reasoning and categorization that directly apply to legal synthesis.

The rational force of a synthesized rule is similarly measured by the quantity of individual instances.[148] The more numerous the sample size, the more certain the resulting generalized principle.[149] Brewer acknowledged John Stuart Mill's argument that "the rational force of . . . induction" depends on the "*number* of statistically significant items . . . 'induced,' " with additional constraints such as legal relevance.[150]

For example, which of the following numerosity scenarios would promote a stronger inference that your house is likely to be burglarized—that one house on your street had been burglarized in the past year or ten houses on your street in the past year? Furthermore, which diversity effect would result in a stronger inference that your house would be targeted—that all burglaries

---

[144] *Similarity Based Induction—Thinking and Reasoning*, MITCH MED. HEALTHCARE (Jan. 27, 2020) (emphasis added), https://www.mitchmedical.us /thinking-reasoning/similaritybased-induction.html [https://perma.cc/Z8HN-WB6M].

[145] As discussed in Part I, Justice Cardozo, in *MacPherson v. Buick Motor Co.,* explored diversity of category members in reasoning about dangerous products. *See supra* Part I; 217 N.Y. 382, 385–89 (1916).

[146] Aldisert, Clowney & Peterson, *supra* note 15, at 14.

[147] *Id.*

[148] ALDISERT, *supra* note 6, at 13.

[149] *Id.* at 92.

[150] Brewer, *supra* note 3, at 932.

occurred in February, and it is now November? Or that the burglaries were spread out over months and seemed to be randomly occurring? Answers to these questions may seem obvious to most readers, yet law students and some lawyers struggle to apply similar principles in legal analysis.

3. Relevant Similarity

Relevant similarity plays a crucial role in induction. Some properties are more inferable or generalizable than others.[151] When we observe an object with various properties, *which* properties are more likely to be projected or inferred to another object than others? This brings the discussion back to the concept of similarity with a focus on *relevant similarity*.

Returning to the burglary example, if your neighbor's home is burglarized, the perceived risk for your home based on the relevant similarity of proximity promotes the inference that your home is at risk, too. The exterior color of your home compared to the color of your neighbor's home, however, is a less relevant similarity than proximity in the burglary scenario. Now, change the relevant similarity induction category to curb appeal for sale of homes—exterior home color may be the relevant similarity for that particular induction category.

Induction is highly dependent on context. People draw inferences and assess similarity between categories differently based on the property being projected—that is, relevant similarity.[152] For example, bagels can be part of the "breads" category or the "breakfast food" category depending on *relevant similarity* of types of chemical structure or meal. Judge Cardozo's *MacPherson* opinion demonstrates this relevant similarity determination as well. Rather than relying on natural similarity and examining only other Buicks, or cars, or wheeled vehicles, Cardozo examined the relevant similarity of dangerous products—poisons, explosives, and other items "reasonably certain to place life and limb in peril when negligently made."[153]

---

[151] Properties have a crucial role in inductive reasoning. Depending on the context, "a particular property may be projectable, nonprojectable, or somewhere in between." Heit, *supra* note 29, at 581.

[152] Brewer, *supra* note 3, at 950.

[153] *See* MacPherson v. Buick Motor Co., 217 N.Y. 382, 385–87, 389 (1916).

C. Novices Prefer Simple, Unidimensional Categories

Numerosity and diversity lead to greater inductive strength, but they also increase task complexity, cognitive load, and difficulty in induction and categorization. More complex concepts are harder to abstract, categorize, and ultimately learn. Researchers have found that novices oversimplify categories when abstracting and categorizing, *especially when the information itself is complex* or when categories are ill-defined.[154]

Novices rely heavily on surface features of category items, rather than abstracting structural features,[155] and prefer the development of unidimensional categories based on single features, such as green things, than those based on multiple features, such as green and square, or green or two-sided.[156] For example, a tendency to create a rule such as "all the things in Category A are red" would be preferable to "things in Category A tend to be red, have four legs, and meow."[157]

Law students, novices to the study of the law and legal analysis, struggle when inducing generalized rules from a set of individual cases satisfying the numerosity and diversity criteria and demonstrate a similar reliance on surface features of individual cases and preference for simpler, unidimensional rules. This is true even when categories are defined, such as in legal casebooks, and increases exponentially in open research. The preference for simple, unidimensional categories and surface features is consistent with law students' preference for parroting of judicial text and creation of simplified rules lacking nuance exemplified by overuse of quotations instead of more complex paraphrasing and synthesis.

D. Limitations in Synthesis in Legal Analysis

Critics of rhetoric and legal synthesis deride it as cookery[158]—the false art of medicine—arguing that induction relies on

---

[154] Eleanor Rosch's prototype theory demonstrates that "classification is graded rather than all-or-none and that some items in a category are 'better' [or more typical category] members than others." Gregory L. Murphy et al., *Do Americans Have a Preference for Rule-Based Classification?*, 41 COGNITIVE SCI. 2026, 2026 (2017). For oversimplification in legal reasoning, *see generally* Sunstein, *supra* note 36.

[155] *See generally* Mary L. Gick & Keith J. Holyoak, *Analogical Problem Solving*, 12 COGNITIVE PSYCHOL. 306 (1980).

[156] Murphy et al., *supra* note 154, at 2047.

[157] *Id.* at 2027–28.

[158] Plato criticized rhetoric for manipulating audiences and manipulating truth, describing rhetoric as akin to cookery, the false art of medicine. Plato, *Gorgias, in*

imaginative moments, suggesting it is a flawed art and logically flawed.[159] These criticisms are partly based on the highly subjective, context-dependent nature of synthesis. Dan Hunter argues that "the interpretation of any given set of cases will differ depending on the interpreter."[160] After introduction to the case method in legal analysis, students realize that the rule of law from a case or a line of cases could be stated differently, each one potentially accurate.[161]

Synthesis reveals the law is malleable. Each individual case may be capable of producing *more than one rule*, depending on the lawyer's need, especially where a rule is implied rather than explicitly stated. Lawyers often disagree on the rule extracted from a single case.[162] When synthesizing a rule based on commonalities in multiple case rules, the categorization of cases could be subjective or incorrect. The lawyer may have relied on an insufficient number of cases in generalizing a synthesized rule, falling into the hasty generalization trap. Even if relying on the same authorities, synthesized rules may differ. While advantageous for persuasive writing and advocacy, this inherent subjectivity can be confusing for novices learning how to analyze "objective[ly]."[163]

COMPLETE WORKS, 462b–466a (John M. Cooper ed., 1997). *See also* Kristen Konrad Robbins, *Philosophy v. Rhetoric in Legal Education: Understanding the Schism Between Doctrinal and Legal Writing Faculty*, 3 J. ASS'N LEGAL WRITING DIRECTORS 108, 113 (2006); Michael D. Murray, *Rule Synthesis and Explanatory Synthesis: A Socratic Dialogue Between IREAC and TREAT*, 8 LEGAL COMM. & RHETORIC 217, 222 (2011) (envisioning a Socratic dialogue between two forms of synthesis of legal authorities: rule synthesis and explanatory synthesis); Brett G. Scharffs, *The Character of Legal Reasoning*, 61 WASH. & LEE L. REV. 733, 775 (2004) ("[P]ractical wisdom, craft, and rhetoric are the three elements that compose or characterize legal reasoning.").

[159] Brewer, *supra* note 3, at 954.

[160] Hunter, *supra* note 19, at 379. Though all lawyers are deriving generalizations inductively, the factors lawyers use may differ as "[t]he choice of factors is an entirely personal one." *Id.* Therefore, we cannot therefore "expect identical rules in each domain since each [lawyer] will induce different rules." *Id.*

[161] Harry W. Jones, *Notes on the Teaching of Legal Method*, 1 J. LEGAL EDUC. 13, 23 (1948).

[162] M. B. W. Sinclair, *The Semantics of Common Law Predicates*, 61 IND. L.J. 373, 385–86 (1986) ("For any given set of data there are indefinitely many possible explanations. Two lawyers working on the same precedent set, but for opposing parties, most often will select two explanatory theories fitting the data but reaching opposite conclusions . . . .").

[163] *See* Gionfriddo, *supra* note 1, at 16 (discussing potential differences in synthesis in objective versus persuasive synthesis).

Legal scholars note the difficulty in distinguishing reasoning from dicta in legal opinions and acknowledge that there are infinite ways that a rule may be formulated to fit an argument.[164] Opposing lawyers working on the same dataset of precedent will persuasively synthesize precedent to advocate for opposing conclusions.[165]

Because lawyers are empowered to dispute claims to authority no matter how formulated, how is one to decide that a rule is reliable?[166] Common responses to judging the reliability of a synthesized rule depend on the judgment of experience—you'll know it when you see it, or it takes experience.[167]

But "it takes experience" is not just dissatisfying; in occluding the synthesis process inexperience, it further propagates the lack of transparency that makes synthesis difficult to teach, learn, and assess. Some research suggests that development of necessary expertise requires thousands of hours of practice or working through 50,000 examples, well beyond the capacity of a three-year legal education.[168]

But all is not lost. Fortunately, scientific research indicates that learners can improve induction and abstract thinking.[169] Research provides specific, concrete recommendations for effective synthesis in the absence of such expertise. The following section will discuss concrete, evidence-based recommendations to *accelerate* abstraction and synthesis in legal analysis to benefit novices and experts. These concrete applications apply not only to legal writing pedagogy, but to legal analysis and pedagogy in general.

---

[164] Michael B. W. Sinclair, *What Is the "R" In "IRAC"?*, 46 N.Y. L. SCH. L. REV. 457, 469–70 (2003). Sinclair points out that "it is a feature of the common law system that there is no way of settling the correct text or formulation of the rules, so that it as a single rule in what Pollock called 'any authentic form of words.' " *Id.* at 470 (citation omitted). If you are lucky, you will find "suitably rule-like abstraction in the opinion . . . expressed in a sentence or two." *Id.* However, if that rule suits your argument but not mine, we are under no obligation to agree that it is the law. *Id.*

[165] Sinclair, *supra* note 162, at 386.

[166] Sinclair, *supra* note 164, at 469–70; Thomas C. Grey, *Langdell's Orthodoxy*, 45 U. PITT. L. REV. 1, 25–26 (1983); Brewer, *supra* note 3, at 932 n.19.

[167] As discussed previously, some legal writing texts explain the need to "test" the synthesized rule for realism or reliability. *See supra* note 79 and accompanying text.

[168] Dedre Gentner et al., *Learning and Transfer: A General Role for Analogical Encoding*, 95 J. EDUC. PSYCHOL. 393, 394 (2003).

[169] Barbara A. Spellman, *Reflections of a Recovering Lawyer: How Becoming a Cognitive Psychologist—and (in Particular) Studying Analogical and Causal Reasoning—Changed My Views About the Field of Psychology and Law*, 79 CHI.-KENT L. REV. 1187, 1195 (2004).

III. HOW LEGAL SYNTHESIS REALLY WORKS

Many difficulties in teaching, performing, and evaluating legal synthesis stem from inducing generalizations from multiple cases with invisible holdings, disparate facts, and conflicting information, as well as from limited instruction on how synthesis works in legal texts.

This Part discusses how synthesis really works and describes concrete, evidence-based steps of legal synthesis informed by cognitive science research. First, abstract individual cases to the "gist" or "abstract" level, rather than the detail level. Second, compare and abstract similarities and general principles from multiple cases whenever possible to observe structural similarities. Third, incorporate numerous and diverse cases to create a comprehensive, reliable synthesized rule. Each will be discussed in more detail below.

A. Abstract Individual Cases Immediately

First, abstract individual cases immediately. The common strategy is to extract a rule from individual cases, but an approach better supported by cognitive theory is to *abstract* single examples to a gist or abstract level, rather than to extract a detailed rule.[170] Abstracting information at a "gist" or "abstract" level rather than at a "detail" level facilitates transfer, categorization, and later induction of rules across multiple cases.[171]

For example, researchers studied the abstraction of structural features in disparate factual examples.[172] Researchers told subjects about an impenetrable fortress held by a brutal dictator, and a general who sought to overtake the impenetrable fortress.[173] The fortress story is an example of a "convergence problem,"[174] where multiple smaller forces converge on a target, but that information was not shared with the research subjects.[175] Subjects were told that the fortress was in the center of the country with

---

[170] *Id.* at 1199.

[171] Jean M. Mandler & Felice Orlich, *Analogical Transfer: The Roles of Schema Abstraction and Awareness*, 31 BULL. PSYCHONOMIC SOC'Y 485, 487 (1993).

[172] Gick & Holyoak, *supra* note 155, at 350 ("Using an analogy involves mapping the representations of two (or perhaps more) instances onto one another. Similar processes may also be involved in *abstracting* the relational structure common to a set of particular instances.").

[173] *See id.* at 351–52.

[174] Mandler & Orlich, *supra* note 171, at 485.

[175] *See* Gick & Holyoak, *supra* note 155, at 319–20.

roads radiating out like spokes on a wheel.[176] The general wanted to overtake the fortress using his military forces, but learned the dictator had placed mines on the roads.[177] The general knew a full-scale attack using large forces would detonate the mines, but individual soldiers could pass unharmed.[178] But sending individual soldiers down the roads would be insufficient to overtake the fortress.[179] The general divided his large army into small groups, dispatched simultaneously on the many roads.[180] Each small group passed down the many roads, safely over the mines, and converged on the fortress in full strength, overtaking the fortress and defeating the dictator.[181]

Subjects were then told to describe the fortress story at one of three different levels: detail, gist, and abstract.[182] In the detail condition, subjects were instructed to provide a factually detailed summary, "including specific characters, places, and actions," such as: "The evil dictator lived in the middle of the country. He planted bombs to allow his troops to come and go, but to deter others, etc."[183] In the gist condition, subjects were instructed to provide the underlying idea or structure of the story, "but still in a concrete form," and "to summarize briefly the main points . . . by stating the general's goal, dilemma, and solution."[184] "The general's goal was to overthrow the dictator with his army. His entire army couldn't go down one road. So he split his army and had them arrive at the fortress at the same time, thereby overthrowing the dictator."[185] In the abstract condition, subjects were instructed to focus on "abstract structure, or relations among the goal, dilemma, and solution, rather than specific objects or actions," to "reflect a more general solution."[186] "An individual wants to overcome a central target with a strong force, but this force can't be applied on one path. So the force is split into smaller lower intensities which converge at the target and overcome it."[187]

---

[176] *Id.* at 351.
[177] *Id.*
[178] *Id.*
[179] *Id.*
[180] *Id.*
[181] *Id.*
[182] Mandler & Orlich, *supra* note 171, at 485–86.
[183] *Id.*
[184] *Id.* at 486.
[185] *Id.*
[186] *Id.*
[187] *Id.*

After describing the fortress example at the detail, gist, or abstract level, subjects were given three distractor reasoning problems and a radiation problem as the target problem to solve.[188] The radiation problem is another convergence problem, again, unknown to the subjects.[189] In the radiation problem, a doctor is treating a patient with a malignant stomach tumor.[190] The tumor is inoperable, but the patient will die if the tumor is not destroyed.[191] A ray can be used to destroy the tumor, but if used at high intensity, the tumor and surrounding healthy tissue will be destroyed.[192] At lower intensity, the ray is harmless to surrounding tissue, but also ineffective at reducing the tumor.[193] The subjects were told to devise a solution to the radiation problem.[194]

The goal of Holyoak's study was to examine which description level—detail, gist, or abstract—would lead subjects to abstract structural relationships between the fortress and radiation examples.[195] Subjects who described the fortress example at a gist or abstract level were much more successful at seeing the structural relationship between the fortress and radiation problems—both types of convergence problems—than subjects who described at the detail level.[196]

Abstraction to the gist and abstract levels allowed subjects to observe structural features necessary for generating rules beyond surface features at the detail level. Abstracting individual examples immediately leads to pattern and relationship recognition across examples and aids synthesis. Barbara Spellman, lawyer and social scientist, recommends changing the way we initially abstract information or representations of information.[197] For example, the fortress story could be abstracted as a general overtaking a brutal dictator or as a powerful force dividing and converging to succeed at a task. The need to abstract individual examples beyond surface details to reveal structural

---

[188] *Id.* at 485.
[189] *Id.*
[190] Gick & Holyoak, *supra* note 155, at 307–08.
[191] *Id.* at 308.
[192] *Id.*
[193] *Id.*
[194] *Id.* at 307–08.
[195] Mandler & Orlich, *supra* note 171, at 485–86.
[196] *Id.* at 486.
[197] *See* Spellman, *supra* note 169, at 1198–99. Spellman offers a unique perspective on this research, as a lawyer who then became a social scientist, reluctantly studying analogy in the context of legal reasoning.

features is supported by scholarship from multiple disciplines on transfer,[198] legal analysis,[199] clinical skills,[200] as well as cognitive psychology.[201]

Effective synthesis begins at the individual case level. For example, rather than describing the fortress example as a case about a general or a case about a fortress, abstraction to the gist or abstract level as a case about how a powerful force that is divided and converged to conquer a target better promotes synthesis.[202]

In legal education, the typical advice for synthesis is to read individual cases and extract an overarching rule. But most novices get stuck on surface features and case details. Any resulting "extracted rule" will likely be subject to the same limitations. Instead, abstract single cases to a higher level of abstraction to the gist or abstract level to move beyond surface details and observe structural features, such as the underlying dispute, material facts, holding, and rationale.

Focusing solely on the detail level—specific surface factual details—obstructs abstraction and transfer. This presents immediate problems for the case method and Socratic method of questioning, as well as current case briefing instruction methods, where the focus is on details of individual cases.[203] Abstracting individual cases to the gist and abstract levels promotes transfer, increases the perception of structural and relational similarities to other examples, and aids in induction of relevant similarity.

---

[198] Brian H. Ross, *Distinguishing Types of Superficial Similarities: Different Effects on the Access and Use of Earlier Problems*, 15 J. EXPERIMENTAL PSYCHOL. 456, 456 (1989).

[199] Laurel Currie Oates, *I Know That I Taught Them How to Do That*, 7 LEGAL WRITING 1, 1, 3 (2001) (footnotes omitted) ("Most problems can be represented in a number of different ways: they can be represented in terms of their surface features, that is, the specific facts of the problem; they can be represented in terms of their underlying structures, that is, those abstract features or principles that are relevant to the solution; and they can be represented in terms of the procedures required to solve problem[s].").

[200] Mary Nicol Bowman & Lisa Brodoff, *Cracking Student Silos: Linking Legal Writing and Clinical Learning Through Transference*, 25 CLINICAL L. REV. 269, 275 (2019) (footnote omitted) ("Much has been written on teaching for transfer, particularly in the last forty years, including a number of useful articles applying that research to legal education.").

[201] Spellman, *supra* note 169, at 1197.

[202] *Id.*

[203] *See* MERTZ, *supra* note 5, at 4–5 (discussing the study of first year courses in multiple law schools of the Socratic method of questioning and heavy reliance on details from individual cases).

B. Abstract Multiple Cases Simultaneously

Second, compare and abstract from two or more cases at once, instead of relying on individual cases, since comparing two cases can lead to a better understanding as a whole even when neither case is well-understood individually.[204] Comparing and abstracting multiple cases simultaneously helps learners recognize both surface features and non-superficial underlying features and structural similarities.[205]

For example, comparing an office to a jail highlights common structural features—constraining environments—rather than irrelevant surface details such as the color of the rug or interior décor.[206] Analyzing two examples simultaneously fosters the extraction of common underlying principles and structural similarities.[207] However, students may not spontaneously abstract general, underlying principles and may need explicit instruction or guidance.

In the same study using the fortress example, researchers had subjects read the fortress story and a story about a firefighter who used many small streams of water simultaneously from different directions to extinguish a large fire.[208] A separate control group only learned the fortress story. Researchers then asked subjects to solve the radiation problem about the inoperable tumor. Subjects who learned about *multiple* examples with similar structural features, such as the fortress problem and firefighter problem, were twice as likely to see the connection, to recognize the problems as convergence problems, and to suggest the convergence solution.[209]

Further, researchers have studied this comparison technique with materials highly relevant to law school learning—case-based learning in a business school negotiation class with MBA students.[210] Subjects who simultaneously analyzed two cases with similar structural features were up to three times more likely to use the abstracted principle than subjects who had analyzed one case at a time.[211] These findings were replicated on novices,

---

[204] Spellman, *supra* note 169, at 1197–98; Gentner et al., *supra* note 168, at 394.

[205] Gentner et al., *supra* note 168, at 394.

[206] *Id.*

[207] *Id.*

[208] Mary L. Gick & Keith J. Holyoak, *Schema Induction and Analogical Transfer*, 15 COGNITIVE PSYCHOL. 1, 21–22, 37 (1983).

[209] *Id.* at 22–23.

[210] Gentner et al., *supra* note 168, at 395.

[211] *Id.*

university undergraduate "students who had little or no formal negotiation experience or management expertise."[212] Students who had directly compared two cases were more likely to transfer principles from the previously studied cases and propose a more sophisticated solution.[213]

Reliance on superficial details inhibits synthesis.[214] Part of the difficulty in legal synthesis is promoting recognition beyond surface details to deeper, structural similarities based on previously unseen features. Many legal writing scholars recognize the value of comparing two or more examples to abstract commonalities.[215] This is apparent in the use of case charting to both organize legal research and to extract general principles and begin the process of synthesis.

C. Numerous, Diverse Cases Yield Stronger Synthesis

Incorporating numerous and diverse cases is the key to comprehensive, reliable synthesis, yet it is also where we go awry. We should all be like Judge Cardozo in *MacPherson v. Buick Motor Company* in evaluating numerous, diverse cases to synthesize a comprehensive reliable rule. Cardozo could have only looked to one other case to synthesize, but he did not. More so, the cases he chose were diverse in surface details and revealed similar structural relationships and similarities. Cardozo could have looked only to other cases involving defective vehicles or vehicle parts. Instead, he synthesized from a diverse, numerous sample set with deeper reach and different surface features, not just five cases about defective wooden wheels or defective manufacture of vehicle parts.[216] Providing law students with many examples with similar structures but diverse surface features is a common technique used in traditional casebooks.[217] While faculty may understand the utility of diverse cases, students do not.

---

[212] *Id.*

[213] *Id.* at 402.

[214] Legal scholars have noted a similar tendency in law students to focus on surface similarities. *See* Oates, *supra* note 199, at 4.

[215] *See, e.g.*, *id.* at 8 (footnote omitted) ("Researchers have found that there is a much higher rate [of] transfer in those fields in which the underlying structures are taught through context-free examples than there is in the fields in which the underlying structures are taught in the context of specific fact patterns.").

[216] *See supra* notes 55–64 and accompanying text.

[217] *See supra* notes 41–50 and accompanying text; Oates, *supra* note 199, at 7 ("Thus, in teaching legal research, instead of providing our students with one example of how to research a problem that requires them to locate a statute and the cases interpreting and applying that statute, we should provide them with a number of

Synthesis of a broad principle from insufficient cases leads to the fallacy of the hasty generalization and unreliable synthesized rules. Legal scholars warn of the dangers in generalizing principles on the basis of a single case, as it takes numerous, diverse examples categorized on relevant similarity to result in a reliable rule—to create a rule "so general, so universal, so capable of dealing with questions of that type that you can say here is an authoritative starting point for legal reasoning in all analogous cases."[218]

CONCLUSION

Legal synthesis is poorly understood, hard to perform and describe, relegated to the hidden curriculum in legal education, but critical to legal reasoning. We can and should demand more precision and systematization to produce reliable, logically sound legal synthesis. To that end, the following recommendations are essential to effective, comprehensive, and logically reliable legal synthesis.

Synthesis begins at the individual case level. First, immediately abstract individual cases from the detail level to the gist or abstract level to move past superficial details and observe structural features. This immediate abstraction allows one to move past specific case details, which inhibit and obstruct later synthesis. Immediately abstracting individual cases when reading, briefing, discussing, and case charting increases synthesis.

Second, abstracting multiple cases simultaneously improves synthesis by revealing structural features and similarities. Because synthesis is contextual and does not occur in a vacuum, abstract multiple cases simultaneously to observe structural similarities and differences. Juxtapose related cases on a similar legal issue. Comparing and abstracting multiple cases simultaneously forces one to move past disparate and conflicting surface details to structural features to evaluate structural similarities and differences.

Third, numerosity and diversity of cases within a category promotes strong, reliable synthesis. When synthesizing a group of

---

different examples."). *See also* Oates, *supra* note 5, at 709 (footnote omitted) ("Under the broader definition of transfer, the casebook method fares much better. One of the casebook method's strengths is its use of contrasting examples.").

[218] Roscoe Pound, *Survey of the Conference Problems*, 14 U. CIN. L. REV. 324, 330–31 (1940).

cases, include numerous and diverse cases, cases with conflicting holdings, facts, and reasoning. While more difficult, synthesis resulting from numerosity and diversity yields stronger, more reliably sound generalizations and representations of group members.