
**PROBLEM SOLVING, DECISION
MAKING, AND PROFESSIONAL
JUDGMENT**

A GUIDE FOR LAWYERS AND
POLICY MAKERS

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OXFORD
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Argentina Austria Brazil Chile Czech Republic France Greece Guatemala Hungary
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Published by Oxford University Press, Inc.
198 Madison Avenue, New York, New York 10016

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Library of Congress Cataloging-in-Publication Data

Brest, Paul
Problem solving, decision making, and professional judgment : a guide for lawyers and
policymakers / Paul Brest, Linda Hamilton Krieger. — 1st ed.
p. cm.
Includes bibliographical references and index.
ISBN 978-0-19-536632-7 (pbk. : alk. paper)
1. Practice of law—Decision making. I. Krieger, Linda Hamilton, 1954– II. Title.
K346.B74 2010
320.6—dc22

2009052053

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*For Lee Ross, for his wisdom and generous
psychology and the study of judgment and
demonstrating how insights from the em
improve, enrich, and ennoble*

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1. PROBLEM-SOLVING AND DECISION-MAKING PROCESSES

Deliberation, Intuition, and Expertise

A client with a problem consults a lawyer rather than, say, a psychologist, social worker, or business advisor because he believes that his problem has a significant legal dimension. But real-world problems seldom conform to the boundaries that define and divide different disciplines, and it is a rare client who wants his lawyer to confine herself strictly to "the law." Rather, most clients expect their lawyers to integrate legal considerations with other aspects of their problem. Solutions are often constrained or facilitated by the law, but finding the *best* solution—that is, a solution that addresses *all* of the client's concerns—often requires more than technical legal skills. Indeed, it often turns out that no solution is ideal in all respects, and that analyzing *trade-offs* is itself an important nonlegal problem-solving skill.

Reflecting this reality, an American Bar Association report on the ten "fundamental lawyering skills" that new lawyers should acquire places "problem solving" at the very top of the list—even before legal analysis.¹ At their best, lawyers serve as society's general problem solvers, skilled in avoiding as well as resolving disputes and in facilitating public and private ordering. They help clients approach and solve problems flexibly and economically, not restricting themselves to the decision frames that "legal thinking" tends to impose on a client's needs. Good lawyers bring more to bear on a problem than legal knowledge and lawyering skills. They bring creativity, common sense, practical wisdom, and that most precious of all qualities, good judgment.

Designing and implementing public policy—whether done by lawyers or people with other professional backgrounds—call for the same attributes. While counseling and litigating focus on the individual client's interests, policy making is intrinsically concerned with many individuals and institutions with different and often clashing interests. Understanding and accommodating competing, even incommensurable, interests and designing policies that will change behaviors in desired ways are among the policy maker's fundamental skills.

This chapter inquires into the nature of problem solving and decision making, both in general and more particularly in lawyers' work with individual clients and policy makers' work in government agencies and nonprofit organizations. To illustrate problems in both domains, we begin with some vignettes from

1. ROBERT MACCRATE, *LEGAL EDUCATION AND PROFESSIONAL DEVELOPMENT—AN EDUCATIONAL CONTINUUM* (St. Paul, West Publishing, 1992).

a day in the professional life of two characters: Luis Trujillo, a partner at a mid-sized law firm in Orange County, California; and Christine Lamm, the director of a county environmental protection agency.

1.1 A DAY IN THE LIFE OF A PROBLEM-SOLVING LAWYER

It is an ordinary, if busy, work day for Luis Trujillo. On arriving at his office, he finds on his calendar an initial consultation with a long-standing client at 9:00 a.m., a noon meeting with Karen Moore, a friend from law school, and an afternoon conference with one of the firm's associates to discuss the strategy in a breach of contract action, which the associate has been handling under Trujillo's mentorship.

Trujillo's nine o'clock meeting is with Jack Serrano, owner of Terra Nueva Properties, a real estate development company that builds and manages low and moderate income rental housing projects in the Orange County area. Serrano takes great pride in his company's reputation for providing family-friendly, affordable housing. Until now, the company has enjoyed good relationships with its tenants and with local, state, and federal government agencies. In all of his many years in business, Serrano has never been involved in litigation.

Serrano arrives for his meeting with Trujillo in a state of obvious distress. He is carrying a copy of the local newspaper, with a front-page story about a wave of illnesses suffered by his tenants, allegedly the result of a polyurethane foam product used to insulate the apartments. The article quotes tenants as saying that the walls of the apartments smell bad, "like chemicals," and it is accompanied by a photo of tenants holding a piece of insulation at arm's length. The article also contains graphic descriptions of the tenants' physical ailments and is accompanied by yet another photo—this one of a lawyer and grim-faced residents of Terra Nueva, captioned "Foam Insulation Syndrome Downs Local Residents—Tenants to File Class Action Lawsuit." The article quotes a report of a consumer organization saying that similar outbreaks of "foam insulation syndrome" have occurred elsewhere in the country.² We return to Trujillo's meeting with Jack Serrano later in this and subsequent chapters.

Trujillo does pro bono work for the Los Angeles Volunteer Legal Services Association (VLSA). After finishing his meeting with Serrano, he turns to a memorandum from VLSA concerning mass firing of employees, without notice, when a small manufacturing plant decided to move its operations to Mexico.

2. For an example of how life imitates hypothetical problems, see Leslie Wayne, *Chinese Drywall Linked to Corrosion*, NEW YORK TIMES, November 23, 2009, <http://www.nytimes.com/2009/11/24/business/energy-environment/24drywall.html?scp=1&sq=chinese%20drywall&st=cse>.

The terminations do not appear to violate either federal or state statutes, but Trujillo has the germ of an idea of how to deal with this (to which we will return in Chapter 3).

Trujillo's musings are interrupted by a phone call from the front desk, alerting him that Karen Moore has arrived and is headed back to his office. Moore is a vice president for Big-Mart, a chain of discount department stores in the region. Trujillo has helped negotiate many real estate contracts for Big-Mart, which has grown quickly to have over thirty stores. Trujillo and Moore spend most of the time discussing a complex deal involving a new location. But toward the end of the lunch, Moore presents a quite different problem.

On Trujillo's advice some years ago, Big-Mart has done regular internal audits to ensure that it is in compliance with the law, rather than await regulatory actions or litigation.³ She reports that the human resources director has taken an extensive look at Big-Mart's employment records, and has discovered an unsettling disparity between the salaries of male and female assistant managers. The average male assistant manager makes \$39,257 a year, while the average woman makes \$38,528—a disparity of \$729.

Trujillo wonders whether the disparity might be due to other factors, such as seniority or education. Resolving this question will require the statistical analysis of Big-Mart's employment data, something we will defer to Part 2 of the book.

Later in the day, Trujillo meets with Anna Wilkins, a recent law school graduate and new associate at the firm. Before turning to the main point of the meeting, a breach of contract case, Trujillo mentions an incident in a trial in a tort case—the first trial in which she ever acted as lead counsel. Anna had been about to object to a question on the ground that it called for hearsay, when Trujillo tugged at her sleeve and indicated that she should let it pass. Wilkins says that she has since checked her recollection of the law. The response would certainly have been inadmissible, and she wonders why Trujillo stopped her from objecting. "You're absolutely right on the law," he says, "but we're really not contesting that particular factual issue. Moreover, we had been making quite a few objections, and the judge was communicating her increasing irritation to the jury."

They then discuss the breach of contract case that Wilkins is handling for the firm. The firm's client, Clyde Evers, has sued Newport Records, a small recording company. Newport refuses to pay for accounting software that Evers customized and installed, saying that the software does not do what Evers said it would do. The amount due is \$600,000.

3. See THOMAS D. BARTON, *PREVENTIVE LAW AND PROBLEM SOLVING: LAWYERING FOR THE FUTURE* (Lake Mary, FL: Vandeplas Publishing, 2009).

Yesterday, Wilkins received a phone call from Evers, who seemed upset that nothing had happened since the case was filed quite a long time ago, and asked her whether she couldn't hasten its resolution.

Based on her knowledge of summary judgment from her Civil Procedure class in law school, her reading of the contract (which disclaims any warranty of performance), and her study of the relevant law concerning warranties, Wilkins believes that Evers can win on summary judgment and proposes to file a motion to that effect. After examining the case file, Trujillo introduces Wilkins to the practical realities of summary judgment practice in the state courts.

Trujillo explains that even though a motion for summary judgment could theoretically bring about a quick disposition of the case, it could have untoward consequences. The judge before whom the motion is likely to be argued views summary judgment—especially for plaintiffs—with considerable skepticism.

It is true that the contract disclaims any warranty of performance. But it appears that Evers had made extravagant oral representations about what the software would do. Even if those representations are not formally binding, they may bias the judge further against summary judgment once he learns of them.

Moreover, the law requires that warranty disclaimers be in a particular typeface, which is somewhat different from the disclaimer in the contract with Newport. The judge might regard the difference as inconsequential and grant summary judgment; or he might have the jury determine whether or not the defendant actually read and understood the disclaimer.

And there is yet another problem. The defendant claims that after a brief trial period it stopped using Evers' software and purchased an off-the-shelf product instead. If the written disclaimer of warranty is ineffective, Newport may have a claim against Evers for breach of warranty. But the statute of limitations on this claim—which is much shorter than the statute of limitations governing Evers' claim—is about to run out. The defendant's lawyer, a local sole practitioner not known for high-quality work, probably hasn't been focusing on the case; but the motion may lead him to pay attention and file the claim.

What's more, Trujillo explains, the cost of litigating the motion for summary judgment will not be insubstantial. If the motion is denied, Evers' costs would be greatly increased. Even if the motion is granted, Newport Records will likely appeal, with attendant costs and the possibility of still having to go to trial.

"Hmmm, I take your points," says Wilkins. "We'll just have to wait until the case comes to trial." But Trujillo responds, "Not so fast. Did Evers give you any indication *why* he was upset that the case wasn't progressing? Surely you discussed the time frame with him at an earlier point." Wilkins replies that Evers mentioned that he was anxious to have the funds from the judgment to invest in a new venture.

Trujillo then asks Wilkins whether she can think of any available options beside moving for summary judgment and waiting for trial, and eventually

they discuss the pros and cons of approaching Newport Records' lawyer with a settlement offer.

1.2 A DAY IN THE LIFE OF A PROBLEM-SOLVING POLICY MAKER

Christine Lamm received a joint degree in law and public policy only ten years ago. A deputy administrator in the county's environmental protection agency, she was catapulted into the role of acting administrator of the department upon the sudden departure of her boss two years ago. Last year, with some misgivings based on her lack of experience and her tendency to do everything "by the book" in an overly deliberative manner that did not always take political realities into account, the mayor formally appointed her head of the department. She serves in that capacity "at the pleasure" of the mayor, meaning that she can be removed by the mayor at will.

Lamm begins the day by continuing to work on a complex project involving the siting of a wastewater treatment plant in Edenville. But the work is interrupted (and will not be resumed until Chapter 4) by an urgent phone call from Paula Henderson, the mayor's chief of staff, about the Terra Nueva affair. The mayor saw the same newspaper articles that brought Serrano to Luis Trujillo's office that morning, and he wants something done about the foam insulation problem "ASAP." Henderson asks Lamm to draft a set of proposed regulations banning use of polyurethane foam insulation in new construction and renovation projects in the county.

Lamm listens anxiously to Henderson's request, mindful that her continued employment turns on her ability to remain in the mayor's good graces. But Lamm doesn't just have her job to worry about; she feels personally and professionally committed to approaching the foam insulation problem at Terra Nueva in a manner consistent with principles of sound public policy making. Quickly calculating how best to mediate between these two sets of concerns, Lamm explains to Henderson that, under the state's Administrative Procedures Act, any regulatory initiative banning the foam insulation will have to be premised on agency findings—arrived at using scientifically acceptable methods—that the foam was in fact causing harm. After a rather pointed response, underscoring the mayor's desire to act decisively in response to requests from community groups that had long supported him, Henderson agrees with Lamm's suggestion that she convene a working group to investigate the causal connection between the insulation product and the symptoms experienced by Terra Nueva residents.

After getting off the phone with Henderson, Lamm decides to take a walk to clear her head, and to give a maintenance worker access to her office to repair a light above her desk. When she returns, she notices that her computer screen is dark, and recalls that she had a number of word-processing and spreadsheet documents open when she left. Grumbling to herself that the last thing she

needs on a stressful day like this is a bunch of lost work, she checks the electric plug, thinking, "I'll bet the maintenance guy accidentally unplugged it when he moved my desk; that sort of thing has happened to me before." She checks under her desk where the electrical socket is located. "It's plugged in, but it seems a little loose," she thinks. "I'll jiggle it." In the process, the plug comes completely loose. The background sound of the hard drive and fan, which she had not noticed until then, suddenly goes silent. The computer had not been on for a while. Christine Lamm discovers that the screen was dark because the cable connecting the computer to the monitor had come loose. Now she in fact has lost some work.

1.3 DEFINING PROBLEM SOLVING AND DECISION MAKING

As these vignettes suggest, in their day-to-day work, lawyers and public policy

makers are constantly working to solve problems, either alone or in collaboration with others. The qualities they need to do this well are sometimes defined in terms of judgment or practical wisdom, the skills in terms of problem solving, and decision making.

The academic and professional literatures provide a variety of definitions of the term *problem*. For example, Charles Kepner and Benjamin Tregoe define it as a situation where "something has gone wrong."⁴ This definition captures at least two of the situations described above. "Something has gone wrong" at Jack Serrano's Terra Nueva apartments, and something "went wrong" with Christine Lamm's computer.

More broadly, law professor Gerald Lopez defines a "problem" as a situation in which "the world we would like varies from the world as it is."⁵ Correspondingly, Lopez defines *problem solving* as "trying to move the world in the desired direction."⁶ This definition aptly describes Christine Lamm's project for siting the wastewater treatment plant. It also describes the situation presented by VLSA's potential case on behalf of the laid-off woodworkers. From the laid-off workers' perspective, "the world they would like" is one with a legally enforceable right to reasonable notice of pending layoffs, if not protection from the layoffs themselves. However, "the world as it is" apparently provides no such claim. Crafting a novel legal theory, and then persuading a judge to apply it and provide a remedy, represents an effort to "move the world in the desired direction."

Problems also include situations where nothing has gone wrong yet, but where there is reason to believe that if some action is not taken, something may

subtle arrangements, to name a few. Part of Trujillo's craft as a lawyer involves his ability to anticipate problems of this sort and to work into the lease agreement mechanisms through which Serrano can address them quickly, effectively, and at the lowest possible cost. Unless anticipated ahead of time, a "something may go wrong" problem can easily become a "something has gone

wrong" problem.

To accommodate problems of these various types, we adopt a more inclusive definition of the term *problem*, similar to that suggested by Allen Newell and Herbert Simon: a "problem" is any situation in which the state of affairs varies, or may in the future vary, from the desired state, and where there is no obvious

way to reach the desired state.⁷ For example, we will see in Chapter 4 that there is no single obvious solution to Christine Lamm's problem of where to site the wastewater treatment plant.

Newell and Simon define the conceptual area between the existing and desired states of affairs as a *problem space*. To solve a problem is to navigate through the problem space—through the virtual area between the actual or potential unsatis-

factory state and the desired state. We can represent this conception of a problem and the problem solving process in the following way, as shown in Figure 1.1.



FIGURE 1.1 THE PROBLEM SPACE.

4. CHARLES H. KEPNER AND BENJAMIN B. TREGOE, *THE NEW RATIONAL MANAGER* viii (Princeton: Princeton, 1981).

5. Gerald P. Lopez, *Lay Lawyering* 32 UCLA LAW REVIEW, 2 (1984).

6. *Id.*

7. ALLEN NEWELL AND HERBERT A. SIMON, *HUMAN PROBLEM SOLVING* (Englewood Cliffs, NJ: Prentice Hall, 1972).

Problem solving often requires solving a number of constituent subproblems. For this reason, the problem space can be viewed as containing a number of segmented paths, one or more of which leads from the initial state to the desired state—if the problem is solvable at all. Each of the nodes located along these paths represents a decision point—a point at which the problem solver must choose between different available courses of action. In most situations, there is more than one possible pathway through a problem space. Sometimes these present themselves as distinct options at the outset. At other times, a single pathway branches off into different directions partway through the traverse. Either way, problem space navigation is almost always multinodal. Moving from one node to the next requires making a decision, as the graphic in Figure 1.2 illustrates.

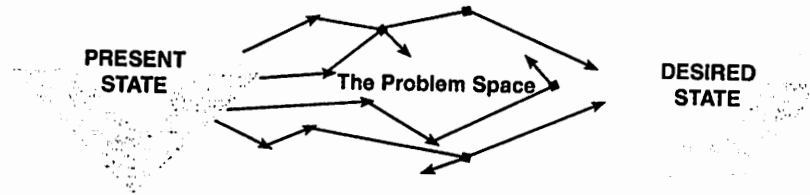


FIGURE 1.2 NAVIGATING THE PROBLEM SPACE.

The various pathways through a problem space may not be equally satisfactory. Some pathways that appear promising at the outset may ultimately prove to be dead ends. Some are inferior because they demand the expenditure of excessive resources, or create new problems even while solving the original one, or because they compromise other objectives. Problem solving is thus subject to what Newell and Simon term *path constraints*. A completely satisfactory solution is a path that leads through the problem space *and* is consistent with all relevant constraints.

The process described by Newell and Simon can be analogized to an expedition by explorers who must cross uncharted territory to get to their desired destination. The explorers may take one path, only to have to backtrack after discovering that it ends at a steep cliff. They may take another and encounter a wide river. How to cross the river in effect poses an ancillary problem, which must be solved to continue the journey. As for path constraints, the explorers might be vegetarians, or might have mores that preclude them from traveling on the Sabbath, which could hinder their progress toward the destination but nevertheless must be taken into account.

If “problem solving” consists of “trying to move the world in the desired direction,” it must ultimately eventuate in a *decision*—a “commitment to a course of

action that is intended to produce a satisfying state of affairs.”⁸ In terms of the preceding discussion, decision making involves choosing a particular pathway across the problem space that lies between the actual and desired states of affairs. The “best” solution to a problem is one that satisfies, to the greatest extent possible, the broadest range of objectives, including constraints, implicated by the problem.

1.4 DELIBERATIVE AND INTUITIVE PROBLEM SOLVING AND DECISION MAKING

There are essentially two distinct, but complementary, approaches to problem solving and decision making. One relies on analysis or deliberation, the other on intuition. While intuition is pervasive, deliberation is relatively rare because, among other things, it requires considerable cognitive energy. Deliberative decision making is informed by intuition at the same time as it corrects for the limitations and biases of pure intuition. Intuition can also be informed by deliberation, as happens in the development of expertise. While the processes of intuition are largely opaque to the decision maker, deliberation is transparent. For this reason, among others, we begin with deliberation.

1.4.1 Deliberative Processes

An ideal deliberative model of decision making consists of the following steps or elements:

1. State, or “frame,” the problem to be solved;
2. Identify and prioritize the relevant values, interests, and objectives;
3. Identify and resolve major uncertainties concerning the cause of the problem;
4. Generate a range of plausible solutions or alternative courses of action;
5. Predict the consequences of the courses of action and assess their impact on the relevant interests or objectives;
6. Select the course of action that optimizes the interests or objectives to be served (i.e., make a decision);
7. Implement, observe, and learn from the outcome of the decision.

The process is recursive, beginning with the need to frame the problem in terms of the interests involved and to consider the interests in the context of the particular problem. After completing step 5, a decision maker would be wise to review the earlier steps, not just because he may have accidentally omitted

8. J. Frank Yates, Elizabeth S. Veinott, and Andrea L. Patalano, *Hard Decisions, Bad Decisions: On Decision Quality and Decision Aiding*, in *EMERGING PERSPECTIVES ON JUDGMENT AND DECISION RESEARCH* 13–63 (Sandra L. Schneider and James Shanteau eds., New York: Cambridge University Press, 2003).

something, but because the concreteness of positing solutions can reframe objectives and his conception of the overall problem.

1.4.1.a Framing the Problem Problem solvers sometimes go about solving the wrong problem because they do not frame the issues adequately. They may mistake symptoms of a problem for the problem itself, or define the problem too narrowly, or define the problem in terms of a ready solution without taking account of the objectives they are actually trying to achieve. Some lawyers might immediately frame Jack Serrano's problem solely as defending against the potential class action suit. By contrast, as we will see in Chapter 2, Trujillo will help Jack Serrano consider the problem at Terra Nueva from a variety of different perspectives, resisting the temptation to adopt the first problem frame that comes to mind.

1.4.1.b Identifying Interests and Objectives The German philosopher Friedrich Nietzsche is reputed to have said, "To forget one's purpose is the commonest form of stupidity."

The best frame for a problem is the one that incorporates the broadest possible range of purposes, interests, objectives, and values implicated by the situation. For this reason, the second step in deliberative problem solving entails a thoroughgoing specification of all relevant interests and objectives, not just those most readily brought to mind. For example, Jack Serrano obviously has an interest in minimizing his legal liability to tenants of Terra Nueva. But he may have other interests, such as his reputation in the community and his ongoing relations with tenants. Because of Christine Lamm's responsibilities as county environmental administrator, concerns for the tenants' health predominate, but they must be balanced against other economic and social interests.

Anna Wilkins thought that a summary judgment motion was the solution to Evers's problem in Newport Records—getting the matter resolved quickly. But this was a solution to a problem she did not fully understand, and could not understand without asking her client *why* he was so anxious to have his case resolved. In considering where to site the waste treatment plant, Christine Lamm will also have to understand her various stakeholders' interests with considerable specificity.

Sometimes, a client may come to a lawyer without a clear sense of his underlying objectives and interests, but with his mind set on a particular solution. In these situations, a good lawyer will slow down the client and help him identify all his interests and objectives before generating, let alone selecting among, alternative courses of action.

1.4.1.c Diagnosing Causes While the causes of some problems are perfectly clear, many others call for analysis or diagnosis. For example, in responding to the situation at Terra Nueva, both Trujillo and Lamm must consider whether Serrano's tenants' distress is really being caused by the foam insulation. It is possible that their symptoms result from or are heightened by a different cause. With respect to gender inequities at Big-Mart, Trujillo's partner will need to determine whether the difference in Big-Mart's compensation of male and

female assistant managers is statistically significant and, if so, whether it is attributable to gender or to some other variable. As Christine Lamm worked her way through her "dead computer" problem, she had to determine or, in any event, should have determined, whether the dark monitor screen resulted from an unplugged power cord or from some other cause.

Just as a physician who misdiagnoses the underlying cause of a set of symptoms is likely to prescribe an unhelpful, or even harmful, treatment, so too may a lawyer or policy maker take useless or counterproductive actions based on an inadequate analysis of the facts. Section 2.5 introduces issues of empirical analysis, which are then considered in detail in Part 2.

1.4.1.d Developing Alternatives The best problem frame is not necessarily the first to come to mind, and this is true of potential solutions or courses of action as well. Problem solving often benefits from a period of divergent thinking about different possible solutions, rather than from rapid convergence on the first seemingly attractive strategic option that sashays by. We examine the generation of alternative courses of action in Chapter 3.

1.4.1.e Evaluating Alternatives Once a variety of potential solutions or courses of action have been generated, a deliberative problem solver proceeds to evaluate them. In this phase, the problem solver must predict the consequences of each plausible option, and then assess the consequences in light of his client's objectives.

We take a first look at evaluating alternatives in Chapter 4, and continue to explore these issues throughout the rest of the book.

1.4.1.f Choosing and Implementing a Course of Action Eventually the problem-solving process comes to a conclusion and a decision must be made. Quite often, this requires making trade-offs among competing interests—a process introduced in Chapter 4 and explored further in Part 3. As implementation progresses, the selected solution is monitored, adjusted if necessary, and reviewed to see what can be learned from the experience of its selection and implementation.

* * *

1.4.2 Divergent and Convergent Thinking

The deliberative approach to problem solving combines elements of *divergent* and *convergent* thinking. Divergent thinking expands the range of perspectives, dimensions, and options related to a problem. Convergent thinking eliminates possible alternatives through the application of critical analysis, thereby eventually reducing the number of options that remain open. Divergent thinking conceives; convergent thinking critiques. Divergent thinking envisions; convergent thinking troubleshoots, fine tunes, selects, and implements.

As the following figure suggests, you can think of divergent thinking as two lines emerging from a common point and then moving away from each other, and of convergent thinking as two lines coming together from different directions on a single point, as shown in Figure 1.3.

Figure 1.4 illustrates how the model of deliberative problem solving just described above combines elements of divergent and convergent thinking.

Early in the process, when a problem is being framed, when interests and objectives are being identified, and when alternative solutions are being generated, divergent thinking can bring a great deal of value to the problem-solving endeavor. Divergent thinking enables us to conceptualize the problem from a wide variety of perspectives, so as to permit consideration of the broadest possible array of potential solutions. Divergent thinking helps identify the full range of interests implicated by a particular decision. And divergent thinking inspires innovation in coming up with solutions to the problem. Later in the process, convergent thinking comes into play in analyzing causation, evaluating options, choosing which course of action to implement, and implementing and monitoring the choice.

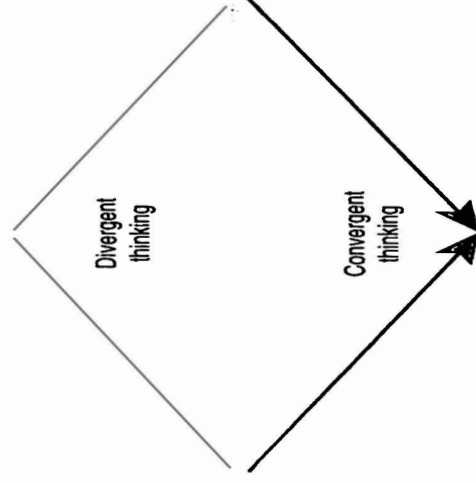


FIGURE 1.3 DIVERGENT AND CONVERGENT THINKING.

1.5 INTUITIVE PROCESSES IN PROBLEM SOLVING AND DECISION MAKING

Intuition or know-how . . . is neither wild guessing nor supernatural inspiration, but the sort of ability we use all the time as we go about our everyday tasks.

—Hubert and Stuart Dreyfus, *Mind Over Machine*⁹

“Most of a person’s everyday life is determined not by their conscious intentions and deliberate choices but by mental processes that are put into motion by features of the environment that operate outside of conscious awareness and guidance.”¹⁰ Most of the time we solve problems without coming close to the conscious, step-by-step analysis of the deliberative approach. In fact, attempting to approach even a small fraction of the problems we encounter in a full, deliberative manner would bring our activities to a screeching halt. Out of necessity, most of problem-solving is intuitive. In contrast with the deliberative model of decision making, intuitive decisions rely on a process “that somehow produces an answer, solution, or idea without the use of a conscious, logically defensible step-by-step process.”¹¹ Intuitive responses “are reached with little apparent

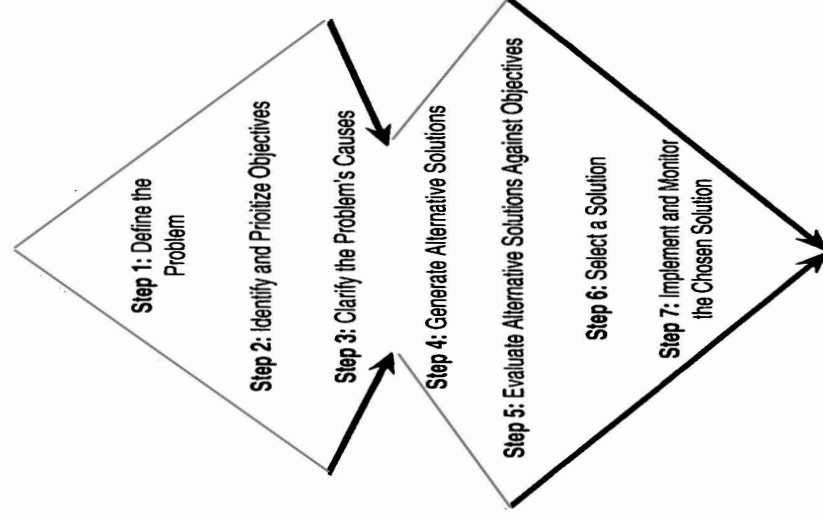


FIGURE 1.4 DIVERGENT AND CONVERGENT ELEMENTS IN FORMAL PROBLEM SOLVING.

9. HUBERT DREYFUS AND STUART DREYFUS, *MIND OVER MACHINE: THE POWER OF HUMAN INTUITIVE EXPERTISE IN THE ERA OF THE COMPUTER* 29 (New York: Free Press, 1986).

10. John Bargh and Tanya Chartrand, *The Unbearable Automaticity of Being*, 54 *AMERICAN PSYCHOLOGIST* 462 (1999).

11. KENNETH HAMMOND, *HUMAN JUDGMENT AND SOCIAL POLICY: IRREDUCIBLE UNCERTAINTY, INEVITABLE ERROR, UNAVOIDABLE INJUSTICE* 60 (New York: Oxford University Press, 1996).

effort, and typically without conscious awareness. They involve little or no conscious deliberation."¹²

1.5.1 Recognition-Primed Decision Making

Experts employ intuition—often informed by deliberation and reflection on past decisions—through a strategy that Gary Klein calls *recognition-primed decision making*.¹³ According to this model, experience in the world gives us myriad problem *schemas*—mental maps that allow us to immediately “size up” a situation, see it as an example of a problem prototype, understand its meaning, and know what action to take.¹⁴ If the problem does not have an obvious solution, then rather than systematically generate and compare a number of options (as in the deliberative model), we evaluate a plausible option through “mental simulation”—by imagining ourselves carrying it out.¹⁵ If this does not seem to lead to a good outcome, we evaluate another possible option.¹⁶

A problem schema often supplies the problem solver with a prefabricated agenda for thought and action. It tells her what features of the problem situation are important, what additional information, if any, is needed, and what action she needs to take to reach a solution. The decision maker can then execute the solution, often automatically, without conscious deliberation or thought. As this description implies, many problem schemas have stock solutions, stored in the mind as part of the schema itself.

The [chess] grand masters . . . use their intuition to recognize the promising moves that they should examine more closely. They shift to an analytic mode by looking at the moves they will play out in the context of the game, and rely on their ability to mentally simulate what will happen if they play a move. In the course of these mental simulations, some of the moves drop out because they are found to contain weaknesses. By the end of the mental simulations, the grand masters are usually left with only a single move they find playable.

— GARY KLEIN, *INTUITION AT WORK* 75 (2003).

12. ROBIN HOGARTH, *EDUCATING INTUITION* 14 (Chicago: University of Chicago Press, 2001).

13. GARY KLEIN, *SOURCES OF POWER: HOW PEOPLE MAKE DECISIONS* 17 (Cambridge: MIT Press, 1998).

14. *Id.* at 17, 89.

15. *Id.* at 20, 21.

16. In the process of solving the problem, we may even change our understanding of the goal we are pursuing. See KLEIN, 122.

Recognition-primed decision making describes the mode of operation of, say, an experienced firefighter deciding on how to make his way safely into a burning building, or a doctor or nurse responding to a medical crisis. Klein describes the response of two nurses working in a neonatal intensive care unit.¹⁷

Darlene had been working with premature infants for a long time; Linda was an experienced nurse, but new to this unit. Linda was responsible for an infant whose temperature had dropped slightly several times during her watch; each time, she turned up the temperature in the isolette. She also noticed that the place in the baby's heel where a medical technician had taken a blood sample was still bleeding a bit, and attributed it to a sloppy procedure. When Darlene saw the baby, something “just looked funny.” After doing a quick physical, she woke up the duty physician, saying that she thought the baby had sepsis. If they had awaited the results of a blood culture before putting the baby on antibiotics, it would probably have been too late. Darlene's experience enabled her to see a pattern which was not available to Linda—and also to respond. As Klein writes:

A “pattern” is a set of cues that usually chunk together, so that if you see a few of the cues you can expect to find the others. When you notice a pattern you may have a sense of familiarity—yes, I've seen that before! As we work in any area, we accumulate experiences and build up a reservoir of recognized patterns. The more patterns we learn, the easier it is to match a new situation to one of the patterns in our reservoir . . .

Once we recognize a pattern, we gain a sense of situation: We know what *cues* are going to be important and need to be monitored. We know what types of *goals* we should be able to accomplish. We have a *sense* of what to expect next. And the patterns include routines for responding. . . . If we see a situation as typical then we can recognize the typical way to react.¹⁸

1.5.2 The Role of Schemas and Scripts

Schematic processing is not only the key to recognition-primed decision making, but to navigating the everyday world. Every person, object, and situation we encounter is unique, but to treat them as such would be impossible. Were we to treat every experience as *sui generis*, we would fast be inundated by an unmanageable complexity that would overwhelm our cognitive capabilities. To function at all, we must radically simplify our experience of the world.

In a classic article entitled *On Perceptual Readiness*, cognitive psychologist Jerome Bruner observed that when we perceive a stimulus from our environment, our first task is to fit that information into some existing knowledge structure

17. Gary Klein, *A Case Study of Intuition*, in *INTUITION AT WORK: WHY DEVELOPING YOUR GUT INSTINCTS WILL MAKE YOU BETTER AT WHAT YOU DO* 3–9 (New York: Doubleday, 2002).

18. *Id.* at 11, 12–13.

represented in memory.¹⁹ Perception is given meaning only when filtered through and incorporated into preexisting cognitive elements, such as schemas.²⁰

As people learn through experience, they organize their acquired knowledge into an interconnected web of associations. A schema represents an individual's accumulated knowledge, beliefs, experiences, and affective orientations toward the schematized construct. The schema activation process is automatic. We do not see an object consisting of four upright legs topped by a square platform and backed by a vertical plane; we see a "chair." The "chair" schema is automatically activated by the incoming visual information. This perception happens unintentionally, outside of conscious awareness, through a process that is not readily interrupted and that interferes little with other ongoing mental activity.²¹

A schema imposes meaning on the inherently ambiguous information supplied by raw perception. Once a schema is activated, we implicitly expect incoming information to be consistent with its elements.²² Schematic processing is both inevitable and a pervasive source of errors of judgment. Our need to impose order on the world leads us to see patterns even where they do not exist, and schemas lie at the core of inaccurate stereotypes based on race, sex, and other factors.

A *script* is a schema consisting of a sequence of social interactions in which you are an actor or observer.²³ Richard Nisbett and Lee Ross analogize a script to a cartoon strip, in which each scene depicts a basic social action; for example, a restaurant script might involve entering, ordering, eating, paying, and leaving. "The importance of scripts . . . lies in the speed and ease with which they make events (or secondhand accounts of events) readily comprehensible and predictable. Their potential cost . . . is the possibility of erroneous interpretations, inaccurate expectations and inflexible modes of response."²⁴

Christine Lamm's response to the computer problem provides an example of schematic processing in everyday life. The sight of her dark computer screen activated a "dead computer" schema, which she had developed as a result of earlier experiences with computers and with other electrical appliances. Once activated, the "dead computer" schema spontaneously supplied a causal theory (electrical cord unplugged), a thumbnail narrative accompanying the causal theory (cord unplugged by the window cleaner), and a solution: "plug in the cord." This intuitive process was virtually self-executing and required very little cognitive exertion. In nontechnical terms, Lamm was just "sizing up the situation."

Schemas and scripts play a role in a lawyer's deciding whether to object to a question put to a witness at trial. The process is more reflexive than reflective: A lawyer instinctively calls out "objection!" and often only formulates a rationale while rising to address the court. Anna Wilkins' and Luis Trujillo's different reactions to the question that called for hearsay flowed from different schemas or scripts. For Wilkins, the question triggered a hearsay schema, based on the rules of evidence she had learned in law school. Trujillo intuitively placed the rules in the broader script of a trial narrative that would be helpful to the client's case.

Beyond these particular examples, lawyers and policy makers are constantly called upon to engage in what Karl Weick has called "sensemaking."²⁵ They must size up or interpret situations—for example, a complex financial transaction—with a keen eye for anomalies, for what might go wrong. Recognizing patterns without allowing oneself to become trapped by them is an essential part of this task.

1.5.3 The Role of Affect

The heart has its reasons that reason does not understand.

—Blaise Pascal

Intuitive problem solving and decision making depends not only on the essentially mental processes of recognizing patterns, but on affect as well. In recent years, researchers have given increasing attention to the role of affect in decision making—ranging from a "faint whisper of emotion to strong feelings of fear and dread, to visceral drives such as hunger and sexual need."²⁶ Thomas Hoving writes that the art historian, Bernard Berenson

19. Jerome Bruner, *On Perceptual Readiness*, 64 *PSYCHOLOGICAL REVIEW*, 123–152 (1958).

20. Eleanor Rosch, *Principles of Categorization* (1978), in *FROM READINGS IN COGNITIVE SCIENCE: A PERSPECTIVE FROM PSYCHOLOGY AND ARTIFICIAL INTELLIGENCE* 312–22 (Allan Collins and Edward E. Smith eds., San Mateo, CA: Morgan Kaufmann Publishers, 1988); ZIVA KUNDA, *SOCIAL COGNITION* (Cambridge: MIT Press, 1999); RICHARD E. NISBETT AND LEE ROSS, *HUMAN INFERENCE: STRATEGIES AND SHORTCOMINGS OF SOCIAL JUDGMENT* (Englewood Cliffs, NJ: Prentice Hall, 1980); SUSAN FISKE AND SHELLEY TAYLOR, *SOCIAL COGNITION* (2d ed. Columbus, OH: McGraw-Hill, 1991); C. NEIL MACRAE ET AL., *STEREOTYPES AND STEREOTYPING* (New York: Guilford Press, 1996). Fiske and Taylor define a *schema* as a "cognitive structure that represents knowledge about a concept or type of stimulus, including its attributes and the relations among those attributes."

21. Laraine Winter, James Uleman, and Cathryn Cuniff, *How Automatic Are Social Judgments?*, 49 *JOURNAL OF PERSONALITY AND SOCIAL PSYCHOLOGY* 904–17 (1985).

22. KUNDA, *SOCIAL COGNITION: MAKING SENSE OF OTHER PEOPLE* 18–21 (Cambridge, MA: MIT Press, 1999).

23. See ROGER C. SCHANK AND ROBERT P. ABELSON, *SCRIPTS, PLANS, GOALS, AND UNDERSTANDING* (Hillsdale, NJ: Erlbaum, 1977); NISBETT AND ROSS, *supra* at 34.

24. NISBETT AND ROSS, *supra* at 34–35.

25. KARL WEICK, *SENSEMAKING IN ORGANIZATIONS: FOUNDATIONS FOR ORGANIZATIONAL SCIENCE* (Thousand Oaks, CA: Sage Publications, 1995).

26. Paul Slovic et al., *The Affect Heuristic*, in *HEURISTICS AND BIASES: THE PSYCHOLOGY OF INTUITIVE JUDGMENT* 397–420 (Thomas Gilovich, Dale Griffin, and Daniel Kahneman eds., New York: Cambridge University Press, 2002). The authors define *affect* as "the specific quality of 'goodness' or 'badness' (1) experienced, as a feeling state (with or without consciousness) and (2) demarcating a positive or negative quality of a stimulus."

sometimes distressed his colleagues with his inability to articulate how he skilled professional must be able to differentiate between her own emotions and could see so clearly the tiny defects and inconsistencies in a particular work those of clients and others. This capacity is a component of so-called *emotional intelligence*.²⁷ Like many of the other skills of intuition, these capacities are best fact, Berenson was able to say only that his stomach felt wrong. He had a curious ringing in his ears. He was struck by a momentary depression. Or he felt improved through reflective experience and practice.

American soldiers in Iraq and Afghanistan with expertise in detecting roadside improvised explosive devices (IEDs) describe affective responses preceding conscious thought. On an unusually quiet morning in Mosul, a sergeant saw a car with the windows rolled up and a couple of children inside, and warned a soldier not to approach the car. "My body suddenly got cooler; you know, that danger feeling."²⁸ A moment later, the car exploded. (See Section 10.5.2 for the sergeant's explanation of this intuition.)

In a laboratory experiment by Antonio Damasio and his colleagues, participants were allowed to gamble by choosing cards from several decks, some of which had been stacked against them. Well before the participants could articulate why they disliked these decks, they showed physiological signs of tension when choosing from them.²⁹

Without emotions, our decision-making processes would be overwhelmed by the burdens of cognition. "The action of biological drives, body states, and emotions may be an indispensable foundation for rationality . . . Rationality is probably shaped and modulated by body signals, even as it performs the most sublime distinctions and acts accordingly."³⁰ Emotions and reasoning exist in a delicate balance, however, and (as we discuss in Chapter 16) emotions can sometimes overwhelm reasoning to our detriment.

Affect plays an important role in many lawyers' activities—not just under pressure in the course of a trial, but in the relative calm of one's office. Consider Luis Trujillo's trying to assess the candor of a witness, or someone he is negotiating with, or, indeed, his client. Or consider Christine Lamm's dealing with upset tenants at Terra Nueva and how her sense of her own professional responsibilities is implicated in how she handles their problem. Among other things, the

1.6 THE INTERACTION OF INTUITION AND DELIBERATION

1.6.1 The Two-Systems Model of Cognition

The two models of decision making described above exemplify what psychologists and cognitive scientists—following the pathbreaking work of Amos Tversky and Daniel Kahneman—have described as a *dual process* or *two-systems model of cognition*. "System 1 quickly proposes intuitive answers to judgment problems as they arise, and System 2 monitors the quality of these proposals, which it may endorse, correct, or override. The judgments that are eventually expressed are *intuitive* if they retain the hypothesized initial proposal without much modification."³¹ Kahneman and Shane Frederick summarize the two systems in this chart in Table 1.1.

TABLE 1.1 THE TWO-SYSTEMS MODEL OF INFORMATION PROCESSING

System 1 (intuitive)	System 2 (reflective)
Process Characteristics	
Automatic	Controlled
Effortless	Effortful
Associative	Deductive
Rapid, parallel	Slow, serial
Process opaque	Self-aware
Skilled action	Rule application
Content on which Processes Act	
Affective	Neutral
Causal properties	Statistics
Concrete, specific	Abstract
Prototypes	Sets

27. THOMAS HOVING, *FALSE IMPRESSIONS: THE HUNT FOR BIG TIME ART FAKES* 19–20 (New York: Simon & Schuster, 1996). For a discussion of the role of intuition in the discovery of another art fraud, see MALCOLM GLADWELL, *BLINK: THE POWER OF THINKING WITHOUT THINKING* 3–17 (New York: Little Brown, 2005).

28. Benedict Carey, *In Battle, Hunches Prove to be Valuable*, *NEW YORK TIMES*, July 28, 2009, http://www.nytimes.com/2009/07/28/health/research/28brain.html?pagewanted=all&_r=1&hp.

29. Antoine Bechara, Hanna Damasio, Daniel Tranel, Antonio R. Damasio, *Deciding Advantageously Before Knowing the Advantageous Strategy*, 275 (5304) *SCIENCE* 1293–95 (Feb. 28, 1997).

30. ANTONIO DAMASIO, *DESCARTES' ERROR* 200 (New York: G.P. Putnam's Sons, 1994).

31. See DANIEL GOLEMAN, *EMOTIONAL INTELLIGENCE: WHY IT CAN MATTER MORE THAN IQ* (10th Anniversary Edition New York: Bantam, 2006); John D. Mayer, Peter Salovey, and David Caruso, *Models of Emotional Intelligence*, in *HANDBOOK OF INTELLIGENCE* 396–420 (Robert Sternberg ed., 2d ed. New York: Cambridge University Press, 2000).

32. Daniel Kahneman and Shane Frederick, *Representativeness Revisited: Attribute Substitution in Intuitive Judgment*, in *HEURISTICS AND BIASES: THE PSYCHOLOGY OF INTUITIVE JUDGMENT*, *supra* at 49.

Kahneman and Frederick suggest that “System 2 endorsements of intuitive judgments are granted quite casually under normal circumstances.” They give the example of this puzzle: “A bat and a ball cost \$1.10 in total. The bat costs \$1 more than the ball. How much does the ball cost?”

Almost everyone we ask reports an initial tendency to answer “10 cents” because the sum of \$1.10 separates naturally into \$1 and 10 cents, and 10 cents is about the right magnitude. Many people yield to this immediate impulse. The surprisingly high rate of errors in this easy problem illustrates how lightly System 1 monitors the output of System 2: people are not accustomed to thinking hard, and are often content to trust a plausible judgment that quickly comes to mind.

At very least, the two systems provide useful metaphors for the different ways that people process information. Moreover, there is considerable evidence that they map onto different physical parts of the brain. Especially when the problem has any affective component, System 1 activities take place in the amygdala and possibly the orbitofrontal cortex; System 2 activities take place in the lateral prefrontal cortex—an area of the brain that is associated with reasoning and that is much larger in human beings than in any other species.³³

1.6.2 The Limits of Deliberation: Bounded Rationality

Problem solving and decision making in professional contexts and in everyday life call for a mixture of intuition and deliberation—of System 1 and System 2 processes. The predominance of intuitive decision making is an inevitable aspect of the human condition of limited cognitive ability and time—what Herbert Simon has called the condition of *bounded rationality*.³⁴

We solve thousands of little problems and make thousands of decisions every day. Given God-like cognitive powers and infinite time, we could apply a deliberative model to all of these actions. But under conditions of bounded rationality, we rely mostly on intuitive decision making. Indeed, we do not think of most events as decisions at all; they are just something we “do.” Even when we are self-conscious about decision making and employ something resembling the deliberative model, we seldom seek to optimize the outcomes of a decision. This would require taking into account and ranking every criterion relevant to our

satisfaction with the outcome. Rather, to use Simon’s evocative neologism, we *satisfice*,³⁵ opting for a reasonably good outcome—often the first that meets some threshold of satisfaction—rather than devoting excessive cognitive energy to seeking the very best.

In both professional and personal contexts, then, human decision making is a continual intermixture of intuitive and deliberative processes, with the consideration of all interests, options, and constraints seldom, if ever, being fully pursued. When the stakes are high and the variables ascertainable, it often makes sense to follow a relatively deliberative route. For example, it makes more sense to articulate your criteria and engage in comparison shopping for an apartment or automobile than for an ice cream cone. But sometimes, even though the stakes are high, time is limited and one has no choice but to rely on recognition-primed, intuitive decision making. As Justice Oliver Wendell Holmes famously remarked in a self-defense case, “Detached reflection cannot be demanded in the presence of an uplifted knife.”³⁶ Consider the on-the-spot decisions demanded of firefighters, police officers, and, for that matter, trial lawyers.

What Herbert Simon writes of judgment by managers applies as well to that of lawyers and policy makers:

It is a fallacy to contrast “analytic” and “intuitive” styles of management. Intuition and judgment—at least good judgment—are simply analyses frozen into habit and into the capacity for rapid response through recognition. Every manager needs to be able to analyze problems systematically (and with the aid of the modern arsenal of analytical tools provided by management science and operations research). Every manager needs also to be able to respond to situations rapidly, a skill that requires the cultivation of intuition and judgment over many years of experience and training. The effective manager does not have the luxury of choosing between “analytic” and “intuitive” approaches to problems. Behaving like a manager means having command of the whole range of management skills and applying them as they become appropriate.³⁷

Kenneth Hammond and Berndt Brehmer have suggested that judgment takes place on a cognitive continuum:

The *analytical* end of the continuum is characterized by a form of thinking that is explicit, sequential, and recoverable. That is, it consists of a series of steps that transform information according to certain rules . . . [which] can be reported by the thinker . . . *Intuitive* thinking, on the other hand, is implicit,

33. Samuel M. McClure et al., *Conflict Monitoring in Cognition-Emotion Competition*, in *THE HANDBOOK OF EMOTION REGULATION* 204–26 (James J. Gross ed., New York: Guilford, 2006); Matthew D. Lieberman, *Reflexive and Reflective Judgment Processes: A Social Cognitive Neuroscience Approach*, in *SOCIAL JUDGMENTS: IMPLICIT AND EXPLICIT PROCESSES* 44–67 (Joseph P. Forgas et al. eds., New York: Cambridge University Press, 2003).

34. HERBERT A. SIMON, *MODELS OF MAN: SOCIAL AND RATIONAL* 204–05 (New York: John Wiley & Sons, 1957); JAMES G. MARCH AND HERBERT A. SIMON, *ORGANIZATIONS* 140–41 (New York: John Wiley & Sons, 1958).

35. SIMON, *supra* note 34.

36. *Brown v. United States*, 256 U.S. 335, 343 (1921).

37. Herbert A. Simon, *Making Management Decisions: The Role of Intuition and Emotion*, 1 *ACADEMY OF MANAGEMENT EXECUTIVE* 57 (Feb. 1987).

nonsequential, and nonrecoverable. Usually, the thinker can report no more than the outcome of his thinking . . . Most instances of thinking will have both intuitive and analytic components. We will refer to this composite as *quasi-rational* thought.³⁸

Most real-world problem solving and decision making is quasi-rational in this sense. One's initial "take" on almost any problem is essentially intuitive. Most problems come to our attention as a result of some trigger, which activates one or more schemas. As a result, we approach a problem with an intuitive grasp of the interests involved; an initial, spontaneously generated hypothesis about its cause; and a corresponding, also spontaneously generated, proposal for its solution. The difference between deliberative and intuitive decision-making processes lies in where our thought processes go from there—on how systematically and deliberatively we navigate through the problem space.

Consider Luis Trujillo's approach to the question whether to seek summary judgment in the Newport Records case. As an experienced litigator, Trujillo's summary judgment schema is embedded in a larger civil litigation script, which includes settlement as well as pretrial or posttrial judgment as a means by which clients' cases are brought to successful conclusion.

Each of the factors Trujillo considers (e.g., the opposing counsel's and judge's reactions to the motion) is a problem-solving exercise in itself, which he approaches largely intuitively rather than through a sustained process of inferential reasoning. As Gary Blasi (from whom we borrowed the Newport Records problem) notes, Trujillo does not retrieve all the irrelevant details of the past summary judgment-related experiences, but rather the "action scripts" he extracted from them. If these scripts had names, they might carry labels like "passive-acting opposing counsel provoked to prepare case," or "state court judge denies legally meritorious summary judgment motion because of general negative attitude toward summary adjudication."³⁹ Trujillo's consideration of the consequences likely to follow from filing the motion also involves mental simulation—imagining what happens if the judge denies or grants it.

Trujillo's handling of the Newport Records situation also reflects elements of a deliberative problem-solving approach. Note, for example, that he did not simply accept the manner in which Wilkins structured the decision to be made: "should we file a motion for summary judgment or wait for trial?" Rather, he reframed the decision as: "given the client's current objectives, what is the best course of action to take at this time?" He explicitly assesses two alternative

courses of action (moving for summary judgment and doing nothing), and concludes that one is superior to the other. While he reaches this conclusion intuitively and quickly, he confirms his hypothesis more systematically in the discussion with Wilkins. Then, recognizing that neither solution meets all of the client's objectives, Trujillo broadens the problem frame—a strategy characteristic of more deliberative problem-solving processes.

As Hubert and Stuart Dreyfus note, "when time permits and much is at stake, detached deliberative rationality . . . can enhance the performance of even the intuitive expert. . . . [S]uch deliberation tests and improves whole intuitions."⁴⁰ Note also—and this is an important element of interaction between lawyers and their clients as well as associates—that the very fact of discourse with Wilkins forces Trujillo to articulate intuitive judgments, a process which tends to move decision making toward analysis and deliberation.

1.6.3 The Necessity and Limits of Intuition

If employing the deliberative model takes too much time—more, really, than we could spend on most decisions—the intuitive model makes a virtue of "jumping to conclusions." It offers a degree of efficiency without which we could not cope with the myriad problems and decisions we encounter daily in our personal and work lives. Trying the most ready-to-mind solution first (such as checking a computer's power cord when the screen is blank) often proves successful and costs far less in time and cognitive effort than taking a more deliberative approach.

However, reliance on mental shortcuts may lead the intuitive decision maker to overlook significant aspects of problems—as in Christine Lamm's analysis of and "solution" to her computer problem—and to consider an impoverished set of potential solutions—as in Anna Wilkins' selection of a summary judgment motion as the obvious response to a client's desire to have his case move quickly to conclusion. Avoiding this error requires, among other things, taking the time to acquire a better understanding of the situation and the client's objectives, and to consider the range of alternatives that might be employed to achieve them.

We return to the strengths and limitations of intuitive judgment throughout the book.

1.7 PROFESSIONAL PROBLEM SOLVING AND THE NATURE OF EXPERTISE

Analysis and intuition work together in the human mind. Although intuition is the final fruit of skill acquisition, analytic thinking is necessary for beginners learning a

38. Kenneth R. Hammond and Berndt Brehmer, *Quasi-Rationality and Distrust: Implications for International Conflict*, in HUMAN JUDGMENT AND SOCIAL INTERACTIONS (Leon Rappoport and David A. Summers eds., New York: Holt, 1973).

39. Gary L. Blasi, *What Lawyers Know: Lawyering Expertise, Cognitive Science, and the Functions of Theory*, 45 JOURNAL OF LEGAL EDUCATION 313, 355 (1995).

40. HUBERT DREYFUS AND STUART DREYFUS, *MIND OVER MACHINE: THE POWER OF HUMAN INTUITIVE EXPERTISE IN THE ERA OF THE COMPUTER* 40 (New York: Free Press, 1986).

new skill. It is also useful at the highest levels of expertise, where it can sharpen and clarify intuitive insights.

—Hubert and Stuart Dreyfus, *Mind Over Machine*⁴¹

What is the relationship between expertise and the two models of problem solving outlined above? Experts and others with proficiency in a subject often rely heavily on intuition, but their intuitions are usually informed and complemented by deliberation.

Before turning to expertise, consider the various nonprofessional activities in which you have *know-how*, *competence*, or *proficiency*—for example, crossing the street, driving a car, cooking, or playing or watching a sport. Although expertise denotes a proficiency (whether in medicine, law, or poker) that sets someone apart from most fellow citizens, we develop competence in these activities of everyday life much as an expert does in a professional domain—through observation, education, mentorship, and feedback from experience. Recall, if you can, the transition from novice to proficient actor—when you learned how to drive, for example—as you moved from approaching each activity deliberately, often with conscious reference to rules or procedures, to (for the most part) just “doing it.”

Both everyday competences and expertise are domain-specific. You can be an expert chef and have no idea what's going on in a football game. In *Life on the Mississippi*, Mark Twain writes:

Give a man a tolerably fair memory to start with, and piloting will develop it into a very colossus of capability. But only in the matters it is daily drilled in. A time would come when the man's facilities could not help noticing landmarks and soundings, and his memory could not help holding on to them with grip of a vise; but if you asked the same man at noon what he had had for breakfast, it would be ten chances to one that he could not tell you. Astonishing things can be done with the human memory if you will devote it faithfully to one particular line of business.⁴²

In what may be one of the earliest texts to connect judgment and expertise, Twain goes on to describe other qualities that an expert must have:

A pilot must have a memory; but there are two higher qualities which he must also have. He must have good and quick judgment and decision, and a cool, calm courage that no peril can shake. Give a man the merest trifle of pluck to start with, and by the time he has become a pilot he cannot be unmanned by any danger a steamboat can get into; but one cannot quite say

the same for judgment. Judgment is a matter of brains, and a man must start with a good stock of that article or he will never succeed as a pilot.⁴³

In a study of nurses' development of expert judgment, Patricia Brenner quotes this description of a novice nursing student:⁴⁴

I gave instructions to the new graduate, very detailed and explicit instructions: When you come in and first see the baby, you take the baby's vital signs and make the physical examination and you check the I.V. sites, and the ventilator and make sure that it works, and you check the monitors and alarms. When I would say this to them, they would do exactly what I told them to do, no matter what else was going on. . . . They couldn't choose which one was the most important. . . . They couldn't do for one baby the things that were most important and then go to the other baby and do the things that were the most important, and leave the things that weren't as important until later on. . . . If I said, you have to do these eight things, . . . they did these things, and they didn't care if their other kid was screaming his head off. When they did realize, they would be like a mule between two piles of hay.

Hubert and Stuart Dreyfus note that the solution for the student is a set of hierarchical decision-making rules, spelling out priorities. As she develops expertise, however, these largely give way to an intuitive sense of the situation.

What does an expert professional, like Luis Trujillo, bring to problem solving in a particular domain that a nonexpert would be unable to provide? Drawing on Newell and Simon's metaphor of problem solving as navigation across a virtual problem space, an expert possesses special navigational knowledge or skill with respect to problems of a particular type. Experts often know about pathways through a problem space of which nonexperts are unaware. Though several paths may look promising at the outset, an expert may be better able to predict which ones will prove to be dead ends or worse.

Thus, a person might hire an expert to navigate a particular type of problem space for the same reasons that a novice group of explorers would hire a guide rather than set out entirely by themselves. An experienced guide has the ability to “read” the terrain, finding likely routes and avoiding perils that would be invisible to the novice. Indeed, in law, medicine, and some other domains, only a licensed professional is permitted to guide another person across a problem space.

Consider Luis Trujillo's expertise in serving as a guide for his client, Jack Serrano, with respect to the complaints of the tenants at Terra Nueva. Trujillo

43. *Id.* at 118–19. We are grateful to James Shanteau, Mark Twain on Expertise, <http://mail.sjdm.org/pipermail/sjdm-society/2007-August/003168.html>, for this quotation.

44. PATRICIA BRENNER, FROM NOVICE TO EXPERT: EXCELLENCE AND POWER IN CLINICAL NURSING PRACTICE 23 (Upper Saddle River, NJ: Pearson Higher Education, 1984), *quoted in* Dreyfus and Dreyfus.

41. *Id.* at xiv.

42. MARK TWAIN, *LIFE ON THE MISSISSIPPI* 116–17 (New York: Penguin Classics, 1883; 1962).

must know the substantive law and relevant procedural rules bearing on the threatened suit whether or not it is filed. Such knowledge is necessary background to considering other means of resolving the problem. If Trujillo does not know the law in this particular area, he has the expertise to research and learn it. (This ability to do legal research is an area of expertise initially acquired at law school and then honed on the job.)⁴⁵

By the same token, in considering the siting of the wastewater treatment plant, Christine Lamm will combine procedural knowledge (likely acquired in public policy school) about how to structure decisions of this sort with substantive knowledge (probably acquired on the job) of the factors relevant to the decision. And in addressing the Terra Nueva problem, it is possible that both Trujillo and Lamm will need to acquire knowledge about medicine, epidemiology, and the properties of polyurethane foam—to understand the connections between exposure to the insulation and the claimed illnesses. They won't have time to—and won't need to—acquire the extensive knowledge that would make them either intuitive or sophisticated analytic problem solvers in these domains; rather, they will have to rely on other experts.

Trujillo and Lamm and the scientific experts on whom they may call differ from laypersons not merely in the quantity of domain-specific knowledge, but in the quality of its cognitive organization. Experts possess large sets of particular schemas, which describe the attributes of domain-relevant problems and contain solutions to them.⁴⁶ The development of professional expertise entails learning many increasingly nuanced expert schemas. Once learned, these schemas enable the expert to recognize recurring patterns, rapidly draw inferences from them, and execute effective responsive interventions.

Robin Hogarth asserts that the essential difference between experts and novices is that they process knowledge differently. Not surprisingly, his description bears a strong resemblance to Gary Klein's description of recognition-primed decision making:⁴⁷

First, experts acquire habits that help them process more information. They learn to counteract limitations in short-term or working memory and are able to "chunk" information more effectively. In other words, despite facing normal limitations on memory, experts find ways of restructuring information so that they can take more into account . . . For example, whereas a medical student might see a patient's symptoms as several different items of

information, the experienced physician may recognize the same information as an instance of a pattern of symptoms, that is, a specific disease.

Second, experts and novices use different problem-solving strategies. Novices tend first to identify a specific goal and then work backward through the details of the problem to find a way to reach that goal. Experts, however, tend first to take in the details of the problem they face, then determine (through a process of recognizing similarities) the general framework that best fits the data, and, finally, work forward from that framework to explore possible solutions (goals). The process that novices follow (working backward) is more deliberate; the process that experts follow (working forward) is more intuitive. Not surprisingly, experts solve problems faster than novices.

In summary, professional expertise involves the development and deployment of an information-rich, schematically organized mental database, which enables the expert to extract key elements from a complex informational array and to match those elements with an existing expert schema stored in memory. Once this match has occurred and the relevant schema has been activated, the schema supplies the expert with a great deal of substantive and procedural information. This information can then be used either intuitively, or through a more deliberative approach, to identify problem-relevant goals and objectives, generate alternative courses of action, accurately predict the consequences associated with those courses of action, and select and then implement the course of action most likely to realize the identified interests and goals.

1.8 LAWYERS AND POLICY MAKERS AS EXPERTS

To understand just what sort of expertise lawyers and policy makers possess, consider these examples of the kinds of tasks they are called upon to perform:

- An appellate lawyer seeks to influence the course of the law by persuading a court that common-law doctrines prohibiting race discrimination by common carriers should prohibit sexual orientation discrimination by landlords.
- A public health administrator is asked by the mayor to develop a set of initiatives to address the disproportionate rate of asthma-related deaths of minority children in a large city in California.
- A company's general counsel works with its president and chief operating officer to develop a procedure for responding to sexual harassment claims if any should arise; or responds to the crisis occasioned by a particular accusation of harassment.
- A business lawyer identifies risks involved in a movie deal, including other parties' incentives to behave strategically, and structures the transaction so as to mitigate the risks to his client.

45. See Gary Marchant and John Robinson, *Is Knowing the Tax Code All It Takes to be a Tax Expert? On the Development of Legal Expertise*, in *TACIT KNOWLEDGE IN PROFESSIONAL PRACTICE* 3–20 (Robert Sternberg and Joseph Horvath eds., Mahwah, NJ: Lawrence Erlbaum, 1999).

46. Kurt Van Lehn, *Problem Solving and Cognitive Skill Acquisition*, in *FOUNDATIONS OF COGNITIVE SCIENCE* 527, 545–46 (Michael I. Posner ed., Cambridge: MIT Press, 1989).

47. HOGARTH, *EDUCATING INTUITION*, *supra* at 158.

- The executive director of a community foundation is asked by her board of directors to develop a plan for grant making over the next five years to reduce teen-age obesity in the community.
- An administrator at the U.S. Fish and Wildlife Service seeks to develop and implement a plan to reintroduce wolves to an area of Montana in which ranchers have traditionally opposed such initiatives.
- A lobbyist for a coalition of marine preservation groups seeks the enactment of legislation banning the use of sonar in or near areas frequented by humpback and gray whales.
- The Governor of American Samoa, an elected official, designs a response to strikes at the two major U.S.-owned tuna packing plants in the territory. The strikers demand that American Samoa no longer be exempted from the minimum wage provisions of the Fair Labor Standards Act; the tuna companies threaten to pull out of American Samoa if the workers don't return and the existing exemptions aren't kept in place.
- An environmental lawyer representing a local government agency negotiates an agreement with neighboring jurisdictions involving the quality of drinking water in their common watershed.

Lawyers arguably bring three different kinds of professional expertise to these diverse tasks: (1) knowledge about the law, legal institutions, and legal actors; (2) knowledge about particular substantive domains; and (3) expertise in problem solving as such. Policy makers bring similar forms of expertise to their work, though their process-related knowledge tends to focus more on legislative and administrative domains rather than those involving judicial institutions.

1.8.1 Lawyers' Knowledge About the Law, Legal Institutions, and Actors

In the first of these vignettes, the lawyer's task of persuading an appellate court to extend settled case law to a new area calls for creative problem solving with respect to both analogical reasoning and advocacy. The task draws on the skills of doctrinal analysis, legal research, writing, and advocacy—many of which play a background role in the other tasks as well. The vignettes also highlight other kinds of legal expertise, such as knowing how to influence judges, juries, administrative officers, and other actors in the legal system.

1.8.2 Policy Makers' Knowledge about Legislative and Administrative Institutions and Processes

In various other of these scenarios, public policy makers must use their knowledge of legislative and administrative and regulatory processes to design workable policies, and to navigate the often complex processes by which they are adopted and implemented.

1.8.3 Expertise in Other Substantive Domains

In addition to knowledge of the legal and policy institutions, many of the tasks outlined in the vignettes draw on experience beyond the domains of law and public policy making as such. The general counsel relies on her sense of how organizations function; and in her crisis prevention mode, she must know how to deal with the press, the public, and investors as much as with legal actors. The same can be said of the Governor of American Samoa. He must know how the U.S. legislative process works, but he must also know how to mediate between angry workers and indignant corporate representatives to resolve a conflict that, if not suitably settled, may do serious harm to both the Samoan economy and its social fabric. The environmental lawyer negotiating for the local government agency must not only be familiar with state and federal water law; she must also know a good deal about water quality standards, hydrology, and other relevant areas of science and technology. The executive director of the community foundation will need to learn a great deal about the behaviors that lead to teen obesity and which local organizations have effective strategies to change those behaviors.

Sometimes, the lawyer's or policy maker's knowledge merely shadows expertise possessed by others, such as an organization's chief operating officer, accountants, or consulting scientists. Sometimes, however, the lawyer or policy maker may have a broader perspective than his or her clients or constituents do—simply by virtue of having encountered analogous problems in other spheres. For example, over a professional lifetime, a good transactional lawyer develops a sense for what can go wrong with a deal and how to guard against it. A policy maker working with administrative agencies and legislatures develops both general know-how about the processes and knowledge about particular officials.

1.8.4 Problem-Solving Expertise

A fundamental premise of this book is that lawyers and policy makers can develop problem-solving expertise applicable to a range of unfamiliar substantive domains. Whether or not this can be tested empirically, you will at least have some intuitions about this by the time you finish the book.

* * *

The materials that follow combine what might be termed positive and negative approaches to problem solving. On the positive side, they provide some of the basic tools necessary for sound and creative problem solving. On the negative or cautionary side, they survey cognitive, social, and motivational phenomena that distort people's perceptions of reality, and impede their understanding and pursuit of their own or their client's goals.