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Group Report: What Is the Role of Heuristics in Litigation?

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ABSTRACT

This chapter examines the role of heuristics in the Anglo-American and Continental litigation systems by considering two broad areas: heuristics that appear in legal rules and procedures, as well as heuristics used by various legal actors (e.g., judges, juries, lawyers).

It begins with theoretical accounts of heuristics in psychology and law. Next, it explores the role that heuristics play in the litigation process from the selection and construction of cases to the appellate process. Although procedural rules are in place to ensure that legal decision processes are deliberative, the complexities and uncertainties inherent in legal judgments promote the use of simplifying heuristic strategies. Accordingly, numerous possible instances of heuristics are identified both in legal rules and in the judgment processes of legal actors. The prescriptive utility of heuristics is considered with reference to competing legal ideals. If legal decision makers are to come closer to legal ideals, then the law must strive for perfection through complexity. If legal ideals take account of psychological reality, then the law should design an environment that recognizes human constraints and thereby facilitates heuristic decision strategies that are adaptive.

Considerably more scientific work is needed to specify the conditions under which various heuristics are used in the legal domain and under which conditions these heuristics are used successfully to achieve legal objectives.

INTRODUCTION

Virtually every human interaction can result in litigation from the most intimate interaction of family members to war. Moreover, these issues will arise in different legal, social, and cultural settings. That this bubbling mass of complexity could be usefully reduced to any single methodology, or approach, whether of

rational choice theory or the heuristic approach, struck us as too implausible to deserve extended discussion. The pertinent question seemed to be what it is people actually *do* rather than whether they only optimize or only employ heuristics.

Some optimizing tools are employed occasionally, such as expected utility calculations in damages, and the law can be viewed as attempting to minimize a loss function described as the total cost of social disputes (combining damages and transaction costs). However, no one claims that optimization can describe the litigation process in its entirety. If one accepts the very narrow concept of “optimization” that has been advanced as procedures used to make a system as effective or functional as possible, then it does not capture much of interest in the litigation process. There are, by contrast, innumerable intellectual tools and strategies that are employed throughout litigation that we believe would be interesting to examine from the perspective of heuristics.

We considered heuristics from the perspective of Gigerenzer, Todd, and the ABC Research Group (1999), who identified “fast and frugal heuristics” that are adaptive and thus useful. We distinguished these from the view of heuristics proposed by Kahneman and Tversky (1974), who predominately identified the biases that may result from use of heuristic strategies. We further identified specific heuristics that may not strictly fit in either of these two approaches, but which nonetheless fit the concept of a psychological judgment heuristic.

Within the litigation process, heuristics might arise in quite different ways. They may be relevant to the decision making of legal actors. Here, researchers may try to predict whether cognitive strategies can best be described by heuristics or by more complex models. Heuristics may also be relevant to the construction of litigation systems. A legislator may attempt to optimize some function by including a role for heuristics within the operation of the system. For example, the use of heuristics might permit the minimization of a loss function. A further interesting aspect of heuristics is their capacity to be exploited by actors within the legal system.

Litigation is embedded in more general governance mechanisms and serves their purposes. Perhaps its most significant attribute is to provide incentives for behavior, including incentives to cooperate. As it becomes increasingly clear that those incentives are not accomplishing their purpose, a complicated procedural structure is set in motion, beginning with the selection of cases for litigation. The cases selected must be prepared for trial on both the legal and factual fronts. Some of those cases will then proceed to trial, which itself is an overwhelmingly complex process (taking into account the inferential tasks), and following trial may be an appeal.

We noted five dichotomies that were likely to be pertinent to all of our discussions:

1. Common versus civil law procedural contexts.
2. Criminal versus civil law cases.

3. Individual (single jurors or judges) versus collective (juries, multiple member courts) decision making.
4. Expert versus lay judgment.
5. The law in the books versus the law in action.

We have organized our discussion over the chronology of litigation, which allowed us to raise the above issues as appropriate to the debate. We first grappled with the concept of a judgment “heuristic” as defined in psychology and discussed its application in the legal domain. We then looked for instances of heuristic use at the different stages of litigation, from the selection of cases to the appellate process. We found heuristics in the form of rules of evidence and procedural law. In addition, we examined heuristics used by legal participants, such as lawyers, judges, and juries. We then considered the prescriptive utility of heuristics for both the legal decision makers and for the development of legal rules. Finally, we reconsidered our conceptualization of the term *heuristics* in light of what we had learned throughout our discussions.

THE CONCEPT OF A JUDGMENT HEURISTIC

Theoretical Background

One goal at this workshop was to explore the analogy between a heuristic information processing procedure as used by psychologists to describe cognitive processes and similar procedures, rules, methods used by actors in legal settings. Thus, we begin with a theoretical discourse of the concept of “heuristic” as it has been under construction by psychologists studying judgment and decision making.

The concept of a “heuristic” had a long history of usages in philosophy, education, mathematics, and computer science before its introduction into psychology (see Schulz, this volume, for a discussion of some of its roots). Its seminal use in the twentieth century was delineated by George Polya (1957) in his book, *How to Solve It*—an attempt to instruct mathematics students on the informal methods that are useful in solving mathematical derivation and proof problems. From Polya, it entered the field of computer science where it referred to a useful, computationally efficient method of solving problems that has a high probability of quickly reaching an effective solution, but with no guarantee of finding the optimal or best solution.

More than thirty years ago, Daniel Kahneman and Amos Tversky (1974) promoted the concept of *heuristic* in the field of judgment and decision making. They proposed that judgments under uncertainty could be understood as resulting from relatively simple mental processes that were adaptive in many situations but which were prone to distinctive systematic errors (biases) in some. For example, it is usually adaptive to estimate frequencies and probabilities by

relying on the ease with which relevant instances of the to-be-judged events can be retrieved from memory (called “the availability heuristic”). When estimating the number of German participants at a conference, a quick attempt to retrieve the names of attendees from memory gives an approximate estimate of the total. However, reliance solely on memory will introduce systematic biases in the judgment; perhaps a tendency to underestimate true totals because of limits on retrieval, or a bias to overestimate the relative numbers of attendees from an especially memorable category.

More generally, we might define the Kahneman and Tversky judgment heuristic as a shortcut mental strategy to solve a judgment problem. We can describe this strategy as an information processing procedure composed of elementary cognitive capacities such as memory retrieval, similarity evaluation, or adjustment from a salient value. Some of the important contributions of the Kahneman and Tversky research program included the following ideas:

1. People rely on shortcut judgment strategies.
2. These strategies are often composed of more elementary cognitive abilities.
3. Judgment often involves substitution of inferences based on one “dimension” (e.g., ease of retrieval, similarity) for another (e.g., frequency, probability).
4. A novel and outrageously popular research method that was based on the identification of the underlying judgment process from its *signature biases* or errors.
5. The research strategy compared human performance to an explicit rational standard of logical coherence (Did the judgments conform to the rules of probability theory?) or accuracy (Did the judgments match the “answer” calculated from Bayes’s theorem? Did the factual answer correspond to the true answer assessed in the external world?).

Subsequent research and reviews led to the concept of a metaphorical “cognitive toolbox” containing judgment and choice heuristics such as “availability,” “representativeness,” “anchor-and-adjust,” “affect-based evaluation,” and an “elimination-by-aspects” choice strategy.

At approximately the same time, a second research program was developing a similar analysis of choice strategies. First John Payne and then his colleagues James Bettman and Eric Johnson constructed what is now known as the “Adaptive Decision Maker” theoretical framework (1993). Their program was also based on the metaphor of a cognitive information processing system with a toolbox of useful strategies and heuristics that could be optionally selected to solve judgment and choice problems encountered in everyday life. Heavily influenced by the methods and theories of Herbert Simon (who is probably responsible for introducing the term *heuristic* to modern psychology), these theorists proposed a set of 11 choice heuristics and defined them as formal computational

algorithms. Their heuristic tools aimed to solve evaluation and choice problems and included procedures such as a “weighted adding heuristic” (an MAUT calculator), a “satisficing evaluator,” and various noncompensatory rules similar to elimination-by-aspects. The distinctive contributions of the Adaptive Decision Maker theorists included (a) the precise specification of a new collection of choice heuristics as computable procedures, and (b) a systematic analysis of the question of what determines the selection of a particular heuristic (from the set of 11). Here they introduced the notion that heuristic strategy selection is a rational choice based on an adaptive consideration of the potential costs and benefits of using one heuristic or another. Moreover, they used systematic computer simulations to test the performance of each heuristic. Further contributions included (c) the use of several criteria to assess the efficiency, rationality, and robustness of each heuristic across a range of hypothetical choice problems, and (d) a systematic program of behavioral research using process-tracing methods.

The most recent program of research on heuristics in judgment and choice is that of Gerd Gigerenzer and his colleagues in the Adaptive Behavior and Cognition Group (ABC) (Gigerenzer et al. 1999). Like their predecessors, the ABC Group begins with the theoretical metaphor of the human as a problem solver with a toolbox of heuristic judgment and choice procedures. They have enlarged the set to include new heuristics, notably social heuristics such as “pass the buck,” “imitation,” and “majority rule.” The distinctive contributions of the ABC Group include precise definitions of the information processing procedures underlying the heuristics; a focus on the optional inclusion and exclusion of problem-relevant information in heuristic processing; extensive tests of the performance of each heuristic in simulations based on representative samples of naturally occurring judgment and choice environments; and the use of optimal statistical models and measures of accuracy to assess the relative success of each heuristic. Perhaps most importantly, the ABC Group has also developed the concept of “ecological rationality” to emphasize the importance of evaluating the performance of hypothesized heuristics in simulations of environments in which they naturally developed and in which they are used.

A guiding precept of ecological rationality is that heuristics will usually be adaptive or appropriate to the environments in which they are used. We rely here on the same diagram as in Kysar et al. (this volume) to discuss the general paradigm for research and theory. Imagine three naturally occurring choice environments (X, Y, Z) and three choice heuristics (A, B, C). Combined they produce a space of nine heuristic–environment pairings, and each heuristic could be tested in each type of environment. Now, imagine that some pairings are more congenial, that each heuristic is especially successful in some, but not in all of the environments. For simplicity, suppose that A–X, B–Y, and C–Z are the adaptive pairings, dubbed “ecologically rational” (“ER” in Figure 16.1), and suppose that the other pairings are less successful, i.e., the “wrong,” maladaptive, heuristic is used in the environment.

One of the most original contributions of the ABC research program is to evaluate the performance of heuristics across a range of representative environments, thus, yielding a more complete theory of the “organism–environment system” as endorsed by Herbert Simon (1955), Egon Brunswik (1952), and others. The guiding precept in the ABC research, namely, to identify the situations in which a given heuristic will be ecologically rational, is exemplified by the diagonal of the heuristics \times environments space in Figure 16.1.¹

We also discussed the issue of whether rational choice theory (RCT) can ever be applied to analyze a legal decision situation in a useful manner. We have to consider Gigerenzer’s (and others’) point that the environment is important. If we apply RCT to an idealized textbook problem (e.g., “Which gamble has the best rate of profits?”), then RCT provides the best possible analysis. Now, if we move into a real-world situation, where we can be assured that the RCT model captures most of the essential characteristics of the environment (e.g., a gambling casino), then again, RCT is the most useful model. However, let us move to a complex and ill-defined situation: two lawyers arguing over a case settlement. We are now less confident in our reliance on the RCT model. Unfortunately, it now becomes a matter of faith, or at least uncertain belief that RCT is a useful guide to behavior. The important insight here is that the usefulness of RCT—just like any heuristic analysis—depends on the situation.

To date, research by the ABC Group on “adaptive rationality” has focused on the ecologically rational conditions. Most of the results from the ABC Group seem to represent congenial heuristic–environment combinations, whereas earlier research, especially by Kahneman and Tversky inspired researchers, focused on the laws of logic and probability rather than natural environments, namely, conditions where there is a mismatch between heuristics and logical principles and where systematic discrepancies abound. Consideration of heuristic performance in a *full range of environments* is enormously important, especially when we want to speculate about performance in new environments. For example, when we want to entertain the possibility that our understanding of cognitive heuristics gained from laboratory research can provide some insights into behavior in a new setting such as legal contexts. Note that the difference between the ABC perspective and the Kahneman-Tversky view is *not* that people are mostly rational or mostly irrational. The normative difference is in the very definition of rational: the ABC rationality is ecological (see Figure 16.1); the Kahneman-Tversky rationality, by contrast, is mostly logical.

¹ One other behavioral research program has been concerned with the heuristics \times environment system. Kenneth Hammond (1996) has characterized judgment processes as lying along a “cognitive continuum” ranging from intuitive to analytic and environments as “inducing” processing of particular types along that continuum. For instance, a computer screen displaying tables of numbers induces analytic judgment; a radar screen induces intuitive judgment. However, the goal of his research has been to identify the tendency of certain environments to *induce* certain types of cognitive processing, not to evaluate the adaptive success of one mode or processing across several environments.

		Environments		
		X	Y	Z
Heuristics	A	ER	bias	
	B		ER	
	C	bias		ER

Figure 16.1 A hypothetical space of choice heuristics (A, B, C) and decision environments (X, Y, Z). “ER,” ecologically rational, refers to combinations of an individual heuristic used in a specific environment that are especially successful (i.e., the adaptive heuristic was used in the environment).

On closer examination of Figure 16.1, we identify some current goals for research. What is the full set of cognitive heuristics (What are the “rows” in the table?), and how are they to be organized: along an intuitive-analytic cognitive continuum, according to the natural underlying cognitive capacities (memory, similarity, evaluation), or according to cognitive computational complexity (e.g., ignorance-based heuristics, one-reason heuristics, multiple-reason heuristics)? What is the range of naturally occurring judgment and decision environments (“columns” in the table), and how should we organize that set: problems (situations) with various statistical (cue-criterion) structures, problems with good and poor feedback, or problems in which competition and principal-agent contingencies create strategic complexities? Finally, what are the adaptive relationships in fact: Do people usually rely on heuristics that are adaptive, that is, that are relatively successful in each environment? Are some heuristics generally more successful?

Heuristics in the Legal Domain

Our discussion of heuristics in legal institutions and behavior began with the proposition that heuristics abound in court because they abound in human reasoning. However, it became clear that we had different notions of what qualified as a “heuristic,” both in psychology and in the legal domain. We thus needed to examine possible definitions of this term from the outset, and, if no consensus could be reached on a conceptual definition, we needed to, at least, collect a set of instructive exemplars of heuristic judgment processes.

Even within psychology, there is no perfect consensus on the definition of a “judgment heuristic.” There is no litmus test that can be applied to determine if a cognitive judgment strategy definitely is or is not a heuristic. Nevertheless, there

does seem to be some consensus on the types of strategies that count as heuristics, some convergence on prototypical heuristics, and conceptual progress toward a larger set of well-defined heuristics.

Decisions in the legal domain can be made at three levels: the individual (i.e., by single judges, jurors, or lawyers), the collective (i.e., by a panel of judges or the jury), and the institutional level (i.e., by legislative bodies in the construction of litigation systems or law firms). Depending on the circumstances, the decisions made might employ heuristics or rational-choice strategies. Heuristics in this framework might display some of the following criteria:

- They are mental (cognitive) shortcuts whereby a variable (or set of variables) that is easier to identify, measure, or manipulate is taken to represent a variable (or set of variables) that is harder to identify, measure, or manipulate to facilitate the process of making some kind of evaluation.
- They are rule-like and simple; still, not every rule that simplifies the law is necessarily a heuristic.
- They describe the process of encoding data and discarding information.
- They are context specific.
- Although, some heuristics are “fast and frugal”² (see Gigerenzer et al. 1999), some of us thought that not all heuristics are necessarily fast and/or frugal.
- Although some of us thought that sometimes heuristics might not be conscious or that they can be intuitive, others required that they be a deliberate choice.

In litigation, it seems we can look for two applications of the psychologists’ concept of heuristics:

1. Can we identify specific heuristic judgment processes of actors involved in litigation? Could we study the behavior of attorneys negotiating the terms of a settlement and identify conscious or unconscious strategies that would qualify as behavioral heuristics? Can we describe the decision-making strategies of judges and juries? For instance, Dhimi and Ayton (2001) carried out a behavioral analysis of magistrates setting bail in an effort to discover the heuristics upon which they rely. Can we then draw any conclusions about how well adapted a legal decision maker is to the task environment? Could we compare the heuristic analysis to a parallel analysis based on a RCT framework?

² Simple or fast and frugal heuristics are defined by Gigerenzer and his colleagues as simple process models based on structural relationships between cues and judgment. The process includes information search, stop, and decision making and can be conscious or unconscious. Most heuristics do not search all relevant cues, do not integrate but substitute cues in noncompensatory way, and often base decisions on one cue. To date, a number of heuristics have been identified for different types of decision-making tasks (e.g., Take The Best for two-alternative choice tasks and matching heuristic for binary classification tasks).

2. Alternatively, at a different level of analysis, can we identify heuristic judgment procedures, analogous to the cognitive heuristics studied in the laboratory, in explicit procedures, official rules, and informal rules of thumb in litigation? For example, if we looked at an attorney's or a law firm's explicit rules of thumb for valuing a settlement offer, would we see a procedure analogous to a psychological heuristic? If we look at the explicit instructions to magistrates prescribing the legally appropriate procedure for bail setting, would we find the essence of a heuristic procedure?

Below we examine these issues at the various stages of the litigation process. During our discussions we identified numerous examples, which we thought would be interesting and useful to explore. However, our catalog is not based on systematic research, though there is research that supports some of the examples. Considerably more work is needed to identify those heuristics and other shortcuts and to specify the conditions under which, and the mechanisms by which, they operate.

THE LITIGATION PROCESS

During the litigation process, lawyers employ strategic behavior in selecting and constructing cases. At preliminary proceedings, judges decide whether cases merit a full trial. Eventually, judges and juries must reach a decision based on the facts presented and the applicable law. Moreover, the whole process must operate within the constraints of evidence and procedural rules. This is obviously a potentially fertile field for the investigation of heuristics. While not every simplified rule of prudence should be called a heuristic, there are many shortcuts for finding, presenting, and deliberating that do qualify as such.

The litigation process can be usefully, if roughly, divided into five components. First, lawyers and potential parties to an action select cases for litigation. By far, most disputes do not result in litigation; they are either ignored and their costs absorbed, or they are resolved through negotiations. There are many reasons for this, and perhaps they can be characterized in economic terms as individuals making cost-benefit calculations or in heuristic terms: It may be better to accept the costs or enter into negotiations rather than sue. Once an individual makes a decision to litigate, legal counsel will be approached to represent a party. Counsel must make similar decisions about whether to pursue the case.

Second, after a case is selected for litigation, the case must be prepared, which we refer to as "constructed for litigation." This involves two quite different processes. The lawyer must first research the law and determine its implications for the dispute. Then, he or she must investigate the case factually. In either situation, the lawyer may attempt to optimize or may rely on simple heuristics.

Third, after case construction has begun, preliminary legal proceedings will soon begin, as well. These vary over differing procedural settings. There is some

uniformity, however. To our knowledge, all systems allow preliminary assessments of the legal sufficiency of the claims, and they allow constrained review of factual allegations. In all systems, an evidentiary presentation can occur in which testimony is taken and documentary evidence received.

Fourth, at some point, the evidentiary process closes, and the judge or jury make a decision on the facts and law.

Finally, another commonality of Western legal systems is an appellate process that allows some review of fact-finding and considerable review of legal determinations.

Case Selection

At the first stage of the litigation process, lawyers and potential parties to an action must select cases for trial. If they were to take rational choice analysis as a norm, the potential parties to a lawsuit would rationally assess the costs and benefits of a trial, assess the probabilities of the various potential outcomes, and then combine these assessments using a normative expectation model (e.g., expected value). The potential parties would also compute the consequences of out-of-court settlements and compare these outcomes to the trial estimates above. This approach implies that cases which actually go to trial are those in which both parties believe that they are likely to obtain a better outcome by going to trial than they would obtain by settling the case (Priest and Klein 1984).

However, the way that people think about the costs, benefits, and risks of litigation may be influenced by a variety of factors, some of which are not part of the economic rational choice model. Consequently, legal disputants may not always make value-maximizing choices. Some of the barriers to economically rational choices include optimism, recency, anchoring, availability, framing, overweighting of low probability events, etc. All of these factors have been shown to affect judgment in psychological studies (e.g., see Babcock and Loewenstein 1997; Hogarth and Einhorn 1992; Kahneman and Frederick 2002), and they may also distort disputants' judgments about their chances of winning at trial and receiving particular outcomes. If true, then case selection may lead to sub-optimal decisions. That is, some disputants may go to trial when they should settle, and others may settle when they would be better off (on average) by taking their chances in the courtroom.

One could argue, however, that the opposite may also be true: A party may rely on one or more traditionally nonrational considerations when deciding whether to go to trial and may benefit by doing so. For example, a plaintiff might choose to go to trial if he or she attaches great weight to the outcome of a recent, vaguely similar, high-profile case in which another plaintiff prevailed. The plaintiff might decide to go forward with his or her case even though the odds of prevailing in such cases have strongly favored the defendant in the past. If the jurors also perceive a similarity between the plaintiff's case and the recent

high-profile case, then they may see more merit in the plaintiff's claim than they otherwise would have. The point is that if legal actors are subject to some of the same influences and biases as legal decision makers, a heuristic approach to case selection may prove to be more beneficial to the legal actors than a more traditional economic approach.

Sometimes, reliance on heuristics in case selection will clearly lead to imperfect decisions. For example, when a potential litigant elects to go to trial with one or more cases selected from among a *set* of potential cases, fact finders can be misled. Although a plaintiff or prosecutor may be involved with just a single case at a time, he or she may have considered and investigated many other possible cases before deciding to proceed with a particular case. In such situations, the fact finder may not be aware of the breadth of the sample space from which the cases (or cases) are selected for litigation. This is a serious problem, because failure to appreciate the size of the sample space of possible cases may cause fact finders to judge the strength of the plaintiff's case to be significantly stronger than it actually is. The following example illustrates the point.

Suppose that the U.S. Attorney General (a) is concerned about the possibility of sex discrimination in promotion decisions among companies in the United States; (b) reviews the ten most recent promotions made in each of 1,000 companies in which a single male candidate competed against a single, equally qualified, female candidate; (c) finds that exactly one company, XYZ, failed to promote a single woman in its last ten promotion cases; (d) brings charges against XYZ for sex discrimination. Fact finders who are told that the XYZ company failed to promote a single woman among its last ten cases in which the female candidate was just as qualified as the male candidate are very likely to view this fact as powerful evidence of unequal treatment of the sexes. In fact, a statistical analysis indicates that such an outcome is likely to be found in about one time in 1000 by chance alone.³ A fact finder who is not told that this particular case was selected for litigation from among a set of 1000 potential cases would likely conclude that the XYZ company's pattern of promoting men over women could not be explained by chance alone. Having reached this conclusion, the fact finder may very well conclude that the XYZ company is guilty of sex discrimination as charged. However, a fact finder who is made aware of the broader sample space would or should recognize that the pattern observed for the XYZ company is precisely the pattern that would occur every now and then *by chance alone* in a large sample space such as one that includes 1000 companies. In other words, the pattern observed in the XYZ company is perfectly consistent with the claim

³ The probability that this event would occur by chance alone is: $\binom{10}{0} (0.5)^0 (0.5)^{10} = 0.00098$.

that the pattern occurred by chance alone once the fact finder understands that this company was singled out from a very large sample space.⁴

However, will a fact finder receive this information? Probably not. The rules of evidence do not compel the plaintiff to reveal all of the other companies that were part of its investigation. Will a fact finder consider the possibility that the case before them was selected from a larger sample space, and that the strength of the case against the defendant is therefore weaker than it may at first appear? Probably not. Preliminary research on this topic indicates that people do not think much about sample space matters, unless such information is made explicit (J.J. Koehler, pers. comm.).

Case Construction

In the second stage of litigation, after case selection, the lawyer's task is to construct a case, that is, to put together a case with a view to a possible presentation in court. The lawyer must research the law and investigate the facts of the case. The supporting facts, means of proof, and legal arguments must be presented to the court in written or oral form as persuasively as possible. These deliberations are a form of strategic behavior that may rely on ready-made shortcuts or heuristics instead of more complicated and perfected judgment methods.

Lawyers in Germany often rely on shortcuts or heuristics that exist in the form of "cook books." The books contain recipes or tactical guidelines offering advice and techniques to assist in the search of evidence or in the construction of arguments. These and similar techniques are the result of many years of experience and may also be found in the unstated working habits of lawyers. The various techniques are devised to avoid overwhelming material, unreliable witnesses, unnecessary facts, evidence, and legal arguments. As to the facts, the choice may lie in stating them in full complexity or reducing the story to make it more palatable for the decision maker. As to the means of proof, a decision may have to be made whether to call many supportive witnesses or only the ones whose testimony promises to be unshakeable even under cross-examination. As to the legal arguments, the claim may be based on a number of them, but it may be easier, more straightforward, and more persuasive to bring forward only the strongest or the least complicated ones. Deals and settlements are a special case. They are in themselves a shortcut to resolving the conflict, but there may also be heuristic techniques for arriving at these shortcuts.

Heuristics in the form of tactical guidelines, techniques, and practices do not constitute unprofessional behavior, even though a more thorough treatment of

⁴ From a Bayesian perspective, matters of sample space inform a fact finder's prior probability estimates, i.e., the chance that the defendant behaved as charged prior to the introduction of specific evidence. The probability that specific evidence (e.g., ten male promotions in succession) would arise by chance informs the fact finder's likelihood estimate, namely, the chance that the ten successive male promotions would occur if, in fact, the company did not behave as charged.

the case would have been possible. The aim of the shortcuts is to support or to replace the creativity of the lawyer, rather than to produce ready-made results that can be chosen and used mechanically. Heuristics are only a mental catalog of items, and it is up to the lawyers to choose the most appropriate.⁵

Preliminary Proceedings

At the third stage of litigation, after case construction has begun, a preliminary hearing is held. Can we identify heuristic procedures, similar to the cognitive heuristics used by legal actors, in explicit procedures?

Most systems of civil procedure are designed to allow the court to throw out a case at the earliest possible stage of the proceedings. Although this objective is common to both the civil law and the common-law approaches, there are important differences in the way the two systems address it. In German procedure, the plaintiff is not required to choose a particular “form of action” or other category in order to state a claim, but instead, is supposed to adduce facts upon which to found the claim. Thus, an attorney representing the plaintiff must ask what the relevant legal rules are upon which the claim might be based in order to allege facts corresponding to the elements the pertinent legal standards require. For the defendant, the task is a mirror image of the plaintiff’s efforts. Of course, the defendant may dispute all or part of the facts that the plaintiff relied on. In addition, he or she will have to think of defenses that can defeat the plaintiff’s claim even though it might be valid. With respect to these defenses, the defendant carries the burden of proof. Consequently, the defendant must consult the law, identify possible defenses, and then allege the specific facts required by the respective legal rules.

Once both parties have stated their claim and defense, respectively, the court applies a three-stage investigation to the pleadings brought before it. As a first cut, the court will assume that all of the facts relied on by the plaintiff are true and then ask whether the law supports his claim. If it does not, that is, if the claim founders on the legal issues alone, it will be dismissed outright. The crucial point here is that the court will not enter into any evidentiary proceedings or order any measures of discovery or disclosure. It will also disregard all of the information supplied—or rather alleged—by the defendant. In this sense, the court could be viewed as applying a heuristic tool.

If at the first stage it is established that the plaintiff successfully made a claim, the court will then turn to the defendant’s case for the second cut. The same procedure applied to the statement of the claim will now be applied to the statement of defense. The judge will assume that all of the facts alleged by the defendant are true and then ask the question whether they have the capacity to defeat the

⁵ In the heuristics terminology, the lawyer has an “adaptive toolbox” of legal heuristics from which to select a suitable heuristic for her purposes, just as ordinary minds pick a heuristic. This process, however, is often done unconsciously.

claim. If, for example, the defendant failed to dispute those facts that form the legal foundation of the plaintiff's claim, the claim will be allowed to go through. Unless the defendant alleges that the time stipulated in a statute of limitations has run out, the court concludes that it has not. For example, the court may presume that the claim only matured at a later point in time, and thus, will "dismiss" the defendant's defense. Again, the dismissal means the plaintiff's claim is allowed to go through.

Finally, it is only if both of the cuts just described have not led to a final resolution of the case that the court opens evidentiary proceedings. Even then, the work done at the two previous stages is not worthless. The investigations at stage one and two have established as a by-product which facts are relevant for the resolution of the dispute, both with respect to the claim and the defense. Therefore, the court will only attend to those pieces of evidence that might support a party's allegations relevant to the claim and the defense. All other evidence is deemed irrelevant and is thus discarded.

The crucial question here is whether the process may be analyzed as the application of a heuristic. It seems that it can be. The court works its way through a fast and frugal decision tree (Gigerenzer, this volume) with two binary cues (see Figure 16.2):

- First cue: If the plaintiff's claim fails to allege facts that are supported by the law \Rightarrow throw the case out. Otherwise proceed.
- Second cue: If the defendant fails to dispute the facts relevant to the plaintiff's claim and fails to state a defense \Rightarrow allow the claim. Otherwise, enter into the evidentiary proceeding.

It seems that the American civil procedure system lacks heuristics like the ones just described. Under the rules of civil procedure, both federal and state, the plaintiff must do no more than state his or her claim in broad terms, without being specific either with respect to the law or to the facts. The factual background of the case will then be assembled through the process of discovery. For this reason, the so-called "dismissal for failure to state a claim upon which relief can be granted" is a toothless instrument. Every lawyer, supposedly, is capable of choosing such broad terms to describe the factual background of the claim on which relief can be granted that a motion to dismiss brought by defendant is bound to fail. Thus, the dismissal for failure to state a claim upon which relief can be granted does not serve the end of making final decisions without the need to investigate the case. The motion for summary judgment is not apt to fill the void either. The standard for allowing this motion is not in the form of a fast and frugal heuristic but relates to the burden of proof which is set at a very high (or low) mark. If it seems highly unlikely that the plaintiff will prevail at trial, his claim may be dismissed by way of summary judgment. To arrive at such a conclusion the court must look at all the facts and at all of the evidence, and it must not limit its attention to only a part of the information brought to its attention.

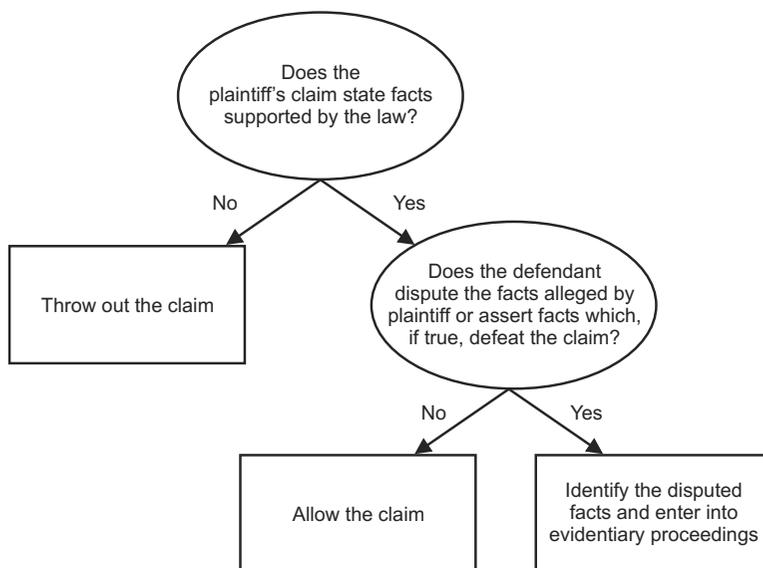


Figure 16.2 Fast and frugal tree of the preliminary proceedings in German courts. These simple trees allow a decision after each question or cue (ellipses) and have $n + 1$ exits (boxes), whereas a complete tree with n binary cues has 2^n exits. Compare the fast and frugal trees in Figures 2.1 and 2.3 (Gigerenzer, this volume).

Evidence and Procedural Rules

Once the judge at the preliminary proceedings allows the plaintiff's claim, the evidentiary presentations begin in which testimony is taken and documentary evidence is received. Similar to the German procedural shortcuts in preliminary hearings, we may be able to find examples of heuristics embedded in explicit legal rules (cf. Schulz; Wagner, both this volume).

The law of evidence is replete with rules that allow the court to ignore information, or rather sources of information. In American law, exclusionary rules are a standard means of limiting the evidence and thus the informational basis of the court. The rationale of most of these rules is that evidence thought to be unreliable is excluded. Pertinent examples are the exclusion of hearsay evidence, and the exclusion of evidence acquired by unlawful means under the "fruit of the poisonous tree" doctrine. Although the latter rule excludes information, it is not intended to be a shortcut. It aims at protecting the rights of the defendant or a witness and not at simplifying the decision process (Schulz, this volume). However, the hearsay rule may assist in expediting the evidentiary process and simplifying the decision task by substituting an easy-to-make judgment ("Is a statement hearsay?") for a harder-to-make judgment ("Is the statement reliable?").

It would be incorrect, however, to conclude that a court observing an exclusionary rule is therefore applying heuristic reasoning. In most cases, the overall decision-making task of the court will remain a complex one even after the exclusion of some pieces of evidence. On the other hand, it seems possible to regard the exclusionary rule itself as based upon a simple heuristic. To see this, one has to imagine a legal world without the exclusionary principle. In such a world, a court would have to grapple with hearsay evidence and would have to attach a particular evidentiary weight to it. In most cases, the evidentiary weight of hearsay evidence will be set at a very low level, just because it is unreliable. Fixing an exact weight to the evidence will allow little progress in the resolution of the dispute but will instead consume scarce resources. In such a situation, it may be preferable to ignore the evidence altogether, without engaging in a case-by-case analysis. Framed in the language of heuristics, the court applies a simple cue in evaluating the evidence: If the evidence is hearsay \Rightarrow ignore it; otherwise \Rightarrow consider it.

This heuristic is one that Anglo-American legal systems have been unable to live with, as it would exclude considerable probative evidence if regularly applied. Thus, a large set of legal rules exist that identify exceptions to the basic hearsay rule. They appear to mimic similarly the logic of fast and frugal heuristics, as they focus on easy-to-identify appearances as signs of hearsay reliability or necessity for their admission. Nevertheless, the purportedly simplifying heuristics embedded in hearsay analysis can create a system that is sufficiently complex and prone to error that the rule has never developed a foothold on the Continent as it has in the U.S. In fact, in Germany, rules of evidence have generally been weeded out of the law during the last 200 years in favor of an open and subjective standard, where judges weigh evidence at their discretion (Wagner, this volume). This, however, did not banish this class of heuristics from the courtroom. It simply removed them from the formal rules and leaves them to operate as an element of judicial evaluation.

In both Anglo-American and Continental systems, heuristics also exist in the form of presumptions. Presumptions, like exclusionary rules, have heuristics at their core. For instance, one might take the fact that a man was married to a woman, about the time she became pregnant, as an easy-to-measure indicator that the husband was the father of the child, and one will usually be correct in this judgment. Rather than require a fact finder to make this inference, some jurisdictions embody the relationship in a conclusive presumption. This means that the fact finder need only determine whether there was a marriage at the appropriate time, there is no need to look for a family resemblance, order blood tests, or even make the mental leap from fact of marriage to fact of fatherhood. Other presumptions, including the fatherhood presumption in many jurisdictions, are flexible and allow the fact finder to arrive at a different conclusion if the circumstantial evidence points in another direction. Presumptions abound in American law, but rather than replace rules of evidence, most presumptions are considered

rules of evidence, and the U.S. Federal Rules of Evidence have an article dealing specifically with presumptions that provides default rules of application when the consequences of presumptions are not specifically spelled out in law.⁶

No American jurisdiction has abolished rules of evidence in ordinary trials, perhaps, because the American justice system is predicated on the jury model: a body composed of laypeople with no professional knowledge or experience in the task of weighing evidence at trials. With respect to the exclusion of hearsay, the U.S. common-law courts long ago said (albeit with many exceptions) “This statement is hearsay, one should be suspicious of it” and then went on to say, in effect, “because we don’t trust the fact finder to be sufficiently suspicious we shall exclude the evidence.” Conversely, in Germany, the fact finder, who is an experienced and legally trained professional judge, is officially trusted to be competent in weighing unreliable evidence appropriately whatever his or her actual skill. Indeed, to this day no one has shown empirically that systems with hearsay rules are more or less accurate in their judgments than systems of free proof.

Legal Rules as Nonheuristics

What a heuristic depends, of course, on how one defines the concept. Most members of our group felt that legal shortcuts, like those discussed above, were properly likened to “psychological heuristics,” because they were built on similar logic to psychological heuristics and worked to the same end. They are judgment heuristics that have been frozen into the legal system as rules of law to simplify the decision maker’s task. However, a minority argued that these rules of law are not heuristic shortcuts, even though they may have cognitive origins, because no mental process occurs. Rather they structure the legal environment so that mental judgment is not needed. (We see no need to resolve the definitional issue here, but think it important to air it.)

These rules of law allow the legal actor to “hide the ball.” Some of these we call “legal fictions.” For example, statutory rape laws in most American jurisdictions assume that a female under a certain age cannot consent to sex. This seems to be based on a heuristic-type simplification, whereby age is taken as a fast and frugal indicator of an inability to consent. Yet, in many jurisdictions, the statutory rape age is set too high for age to be a plausible indicator of a true inability to know what one is agreeing to. Rather, from a moral or paternalistic perspective, the law believes girls below a certain age should not be having sex, regardless of whether they consent. Consequently, it penalizes men who have intercourse with minors; even if it was reasonable for the man to assume the woman was of an age where she could have consented, and any observer outside of a court of law would have assumed consent was freely and intelligently given. Similarly, the law considers the signature on a form contract as a cue of a

⁶ Judge trials’ and most administrative trials’ rules of evidence are, with a few exceptions such as privileges, greatly relaxed or even abolished as rules.

knowing and valid consent to the contract's terms, the same as the signature on any contract. However, this too the law knows to be a fiction. Rather, our economic system requires us to bind people to form contracts whether or not they would have freely consented to what the contract provides.

These rules serve as shortcuts because they are embodied in the law and do not require the fact finder to engage in any mental effort to make the connection between factual indicator and the supposed factual conclusion. The existence of the supposed factual connection is in fact irrelevant to the law's purposes. Thus, the statutory rape law could just as well say, "any sexual intercourse with a woman below the age of 16 years is rape" without bothering to presume that women under age sixteen are incapable of appreciating what they are allowing when they consent to sex. Similarly, the law of contracts might state, "If you sign your name to a form contract you are bound by its terms whether or not you read them or would have agreed to those terms had you read them." The law has no need to posit a relationship between the signature and consent.

In conclusion, we see that legal systems in general, and evidentiary rules in particular, are replete with shortcuts aimed at increasing the efficiency of case processing and legal decision making while promoting, or at least not diminishing, accuracy and justice. Whether the heuristics employed by the legal system and its other shortcuts work to promote justice and efficiency is, however, an empirical question. Although we know something about some areas, such as the mistakes that can occur if eyewitness confidence is taken as the prime sign of accuracy (see DePaulo et al. 1997), empirical answers to these questions are, by and large, hard to come by. This is especially true if justice rather than speed or cost is the outcome we are most interested in. Usually, nobody knows how to assess the correctness of a judgment as there is rarely any outcome feedback. Even where there is feedback, as with recent "DNA acquittals" of the wrongfully convicted, it is usually impossible to say whether heuristic reasoning or heuristics built into legal rules were crucial to the unjust outcome. Although there are strong partisans of the Anglo-American and Continental legal systems on both sides of the Atlantic, no one has yet demonstrated empirically that one system yields more just and accurate results than the other, or that heuristic-like evidentiary rules, such as the hearsay rule, are better or worse than German-type "free proof" in getting at the truth.

Legal Decision Makers

At some point during litigation, the evidentiary process closes, and the judge and jury are required to make a decision on the law and facts. In this context, we might apply psychological models to an analysis of the decision makers' behavior and aim to predict their strategy use. Can heuristics, rather than complex strategies, better predict the behavior of legal decision makers?

Judges

Let us start with an example of fast and frugal heuristics in English magistrates' bail decision making. The Magistrates' Court lies at the heart of the English criminal justice system as it deals with the majority of all criminal cases. The vast majority of magistrates are trained (but not necessarily legally qualified) lay people who perform judicial duties on a part-time, unpaid basis. They usually make decisions as a bench of two or three. A small minority are stipendiary magistrates who are legally qualified, experienced, and perform judicial duties on a full-time, paid basis. They usually make decisions alone. All magistrates can pass sentences concerning summary offenses, which are mostly minor (e.g., shoplifting, motoring matters, drunkenness) carrying a certain maximum penalty. They will refer very serious (indictable) offenses, such as murder, to the Crown Court for trial by judge and jury. Other offenses that are triable either way, such as aggravated bodily harm, may be tried in either court by the request of the defendant or magistrates.

Whenever a case is adjourned for trial, sentence or appeal, magistrates must make a decision as to bail (release) the defendant or remand him or her in custody until the next hearing of the case in court. This decision is guided by the law (i.e., U.K. Bail Act of 1976 with its subsequent revisions), which states that most defendants have a right to bail, although bail can be denied (thus defendants can be remanded in custody) if there are "substantial grounds" for believing that a defendant may abscond, offend, or obstruct justice. Magistrates are required to assess the risks of these events occurring by having "regard to" certain case factors (e.g., seriousness of offense, strength of defendant's community ties) as well as any others that "appear to be relevant."

However, in practice, magistrates' bail decision making may also be influenced by other features of the task. These include the order of information presentation, the availability and quality of information, opportunities to learn from the task, and time pressure. There are no statutory rules of procedure governing bail proceedings in Magistrates' Courts. There is often a lack of information available when making bail decisions. When information is available, magistrates do not know how useful different information is in predicting whether a defendant if bailed unconditionally will abscond, offend, or interfere with witnesses. There is no formal procedure for providing magistrates with outcome feedback. Finally, despite the lack of time limits for making decisions on a case, magistrates may implicitly feel that they are working under time pressure due to the high daily caseload.

Research has recently compared the bail law in books with the bail law in action. Experimental and observational studies demonstrated that individual magistrates' bail decisions and those of benches of magistrates were better predicted by a fast and frugal tree called the "matching heuristic" (Dhimi 2003; Dhimi and Ayton 2001). This heuristic searches through a subset of the available

information and bases decisions on one cue alone (e.g., on the defendant's prior convictions) in a noncompensatory way, rather than using more complex strategies that weight and integrate all of the available information in a compensatory way (see Figure 2.3 in Gigerenzer, this volume). Different magistrates used different cues, and sometimes, based their decisions on "extra-legal" factors (e.g., the defendant's gender) or "legal" factors such as the prosecution or police requests (although these were not related to any legally relevant variables). Indeed, the simple heuristic described the decision-making behavior of both lay and stipendiary magistrates and those with more or less experience on the bench. Other evidence for the use of such simple heuristics comes from records of the duration of bail hearings that reveal they last only a few minutes. Therefore, while the law on bail requires magistrates to consider several cues, they do not do this but rather rely on heuristic thinking.

Fast and Fragile Heuristics?

Although heuristic decision making may carry positive benefits, such as speed, economy, and reasonable accuracy (see Gigerenzer et al. 1999), trial judges' use of heuristics may sometimes result in systematically biased rulings. Consider evidentiary admissibility judgments. Trial judges must decide whether to admit or exclude evidence proffered by one side or the other. A key part of this admissibility decision turns on the judge's belief about the probative value of the evidence. In the U.S., evidence that is not probative of any material fact is excluded. Probative evidence is generally admitted unless its probative value is substantially outweighed by the danger of unfair prejudice, confusion of the issues, misleading the jury, considerations of undue delay, waste of time, or needless presentation of cumulative evidence (Federal Rule of Evidence 403). Although trial judges generally have experience making judgments of probative value, the heuristics they use may lead them to admit irrelevant evidence while excluding relevant evidence.

Consider a child abuse case in which the prosecutor wishes to introduce evidence that the alleged victim had nightmares to bolster his claim that abuse occurred. How might a U.S. judge go about determining whether nightmares are probative of abuse? The guiding rule in U.S. courts is that evidence is probative of a material fact if that evidence makes the existence of the fact more or less probable than it would be without the evidence (Federal Rule of Evidence 401). As a practical matter, judges are likely to fall back on a simple heuristic when trying to implement this legal standard. In child abuse cases, it appears that some judges use a simplifying rule we will identify as the "frequency heuristic." According to this heuristic, evidence (such as nightmares) is probative of a condition (such as abuse) if the evidence occurs frequently when the condition is known to be present. Thus, judges who use the frequency heuristic would likely conclude that nightmares are probative of abuse because it is known that abused children frequently have nightmares.

Despite its intuitive appeal and use in child abuse cases (e.g., *Commonwealth v. Dunkle* 1992), the frequency heuristic can lead judges astray. The reason is that this heuristic ignores the frequency with which the evidence occurs when the condition is absent. In our example, it ignores the frequency with which nightmares occur among nonabused children. As it happens, studies indicate that nightmares are equally common in abused and nonabused children (Hibbard and Hartman 1992). To the extent that these studies are persuasive for the instant case, nightmares are not probative of abuse, and should not be admissible. Likewise, even uncommon symptoms of abuse may be highly probative if they are still more uncommon among nonabused children. Gonorrhea has been observed in less than 5% of sexually abused children. Yet, because gonorrhea is virtually nonexistent among children who have not had sexual contact, the presence of gonorrhea in an allegedly abused child provides strong evidence that abuse has occurred (Lyon and Koehler 1996). In short, judges who use a frequency heuristic to assess probative value will sometimes make demonstrably poor admissibility decisions. However, we do not know how common such errors are, nor do we know the costs they impose on the goals of the litigation process.

Juries

Koehler (this volume) offers a pessimistic perspective about juror reasoning and decision processes. He postulates that the heuristics juries use when reaching verdicts often reflect ignorance, misunderstanding, confusion, and poor logic. He provides evidence from studies with mock jury research and from interviews and surveys with actual jurors that people commonly misunderstand rules of law, legal presumptions, and applicable standards of proof. Jurors sometimes ignore relevant evidence, and rely on irrelevant information, even when they are explicitly told not to use it. They also make inappropriate inferences by incorporating elements of cases that are consistent with their preferred stories of what occurred, even when the evidence did not include these elements. Whether these problems spring from cognitive deficits or normal psychological tendencies of decision makers who must make sense of a surfeit of complex, conflicting, and/or emotionally laden information, jurors are likely to invoke heuristics as decision aids. Below, we identify various heuristics that juries might use but can only speculate on whether or not they result in sound verdicts.

Hastie and Wittenbrink (this volume) suggest that juries employ fast and frugal cognitive heuristics to explain the evidence that they hear. Jurors weave key elements of the evidence into stories to help them make sense of the facts presented, and make inferences to fill in the details of the story. The process wherein jurors construct stories can be viewed as a heuristic. Further, research by Pennington and Hastie (1991) has shown that causal structures that facilitate story construction increase the plausibility of the claims made by the party

offering the story. Jurors may use ease of story construction as a cue to the likelihood that events unfolded as the story suggests.

In complex cases, story construction may be neither fast nor frugal. However, some of the fast and frugal heuristics identified by Gigerenzer and the ABC Group (1999) no doubt play a role in jury decisions. For example, “Take The Best” may be employed when fact finders are deciding between conflicting testimony or conflicting evidence. (Take the Best goes through successive cues and bases a decision on the first cue that points in one direction, unless the cues are exhausted and the process stops.) Thus a jury confronted by opposing experts, one of whom has impressive credentials (e.g., Ph.D. from a prestigious university) while the other has weak credentials (e.g., bachelor’s degree from a local college), may simply take the word of the person who has the better credentials rather than try to evaluate the quality of the scientific arguments each expert offers. Similarly, a police officer’s testimony may be credited over a defendant’s testimony, because the police officer is seen as an “authority” figure and thus as a better (more neutral) witness. In circumstances like these, the Take The Best heuristic may do as well as—or better than—other ways of deciding between conflicting testimony.

Difficulties arise because lawyers, knowing that jurors will rely on heuristic reasoning, strive to acquire witnesses who give the appearance of expertise and neutrality, regardless of the merits of their position. When the reliability of opposing witnesses is crafted and manipulated by lawyers, as is often the case with opposing scientific experts, the ecological rationality of the cues, and thereby of Take The Best, may decrease. This is a perfect example of a case in which a multi-agent competitive environment makes it difficult to determine if heuristic reasoning is adaptive. If there were no lawyers involved, it is plausible that the most memorable, most central evidence would be the most reliable and probative. However, lawyers manipulate evidence to make the most useful facts and inferences for their side of the case also the most memorable, most emotion-provoking, etc. (see the discussion on affect-based decisions and availability below). Now, heuristic cues and strategies are no longer correlated with the actual validity and jurors reasoning in a fast and frugal manner may be confused or misled by their normal judgment habits.

For heuristic reasoning to be successful cues must be thought to be relevant and reliable in the sense that they allow one to draw accurate conclusions concerning the underlying fact, for example, the guilt of the defendant. In addition, cues must be readily available. A heuristic is of little use if the cues it depends on are elusive or ambiguous. In these circumstances, the legal task can be made even more difficult. Yet, easy-to-come-by cues are particularly likely to be poor indicators of underlying facts because if they are common and accessible, they are likely to be associated with a wide variety of behavior. For example, eyewitness confidence seems to be used by most jurors as an indicator of eyewitness reliability, yet a body of research finds only a slight relationship, if any, between eyewitness confidence and eyewitness accuracy (e.g., DePaulo et al. 1997).

The heuristics that Kahneman and Tversky (1974) proposed may also play a role in legal decision making. For instance, “representativeness” (i.e., a strategy for making judgments based on the extent to which current stimuli resemble other stimuli or categories) may be a heuristic that jurors use and that lawyers try to manipulate (see Kysar et al., this volume). Hastie and Wittenbrink (this volume) conjecture that in some cases, jurors’ (and judges’) decisions turn largely on the defendant’s (or other party’s) social category membership, that is, they are based more on prejudice than on a fair evaluation of the evidence. A criminal defense lawyer may be aware of such prejudices and for this reason may advise his or her client, who is say a large unemployed black male, to accept a plea bargain that would be rejected if the client did not so closely fit (or represent) a likely juror stereotype of a violent criminal. As considerable research suggests, prejudice-based decisions tend to influence jury decisions when the evidence is close and does not strongly suggest a verdict.

Hastie and Wittenbrink’s discussion of the role of prejudice in juror decisions is closely related to affect-based judgments; many would say that prejudice-based judgments are a specific example of the notion of an “affect heuristic.” Finucane et al. (2000) describe the affect heuristic as characterized by reliance on feelings (with or without consciousness), such as a specific quality of goodness or badness, which influence decisions. In the legal domain, the feeling that fact finders have toward a witness or party may affect their judgment, even when they cannot point to specific evidence supporting that judgment. Moreover, affect might motivate a fact finder to assemble and attend to facts in ways that support a particular verdict, irrespective of the strength of other evidence. The affect heuristic may also make information more available. For instance, vivid evidence may be more influential with legal fact finders than evidence that is pallid. Whereas a vivid, bloody photograph of a murder victim may be less valuable for determining whether the defendant committed a crime than a pallid statistical analysis of fibers recovered from the crime scene, the bloody photograph may actually persuade jurors that the defendant deserves to be convicted. The vivid photograph, unlike the pallid statistical analysis, is likely to arouse strong emotions and in this way stand out for jurors and be more available to them during deliberations.

A further example is the “anchoring and adjustment heuristic.” According to Kahneman and Tversky (1974), when people estimate an unknown quality (e.g., this year’s murder rate), they anchor on convenient initial values (e.g., last year’s murder rate), and then adjust this estimate—usually insufficiently—to take other considerations into account. In the legal domain, the anchoring and adjustment heuristic may be responsible for the finding that large damage requests tend to elicit larger jury awards than smaller requests. Even if the large request seems excessive, the request acts as an anchor that encourages jurors to return rather large awards (see Hastie et al. 1999; Chapman and Bornstein 1996).

Our final example is what might be called the “association heuristic.” One concludes a fact exists not from proof of the fact, but from an association that

suggests the fact's existence. For example, suppose the Pope testified as a character witness for a defendant. Putting aside the nonheuristic inferences that can be made from good character to innocence, a fact finder might conclude that the Pope would never testify for someone who is guilty. So, the very fact that the Pope was willing to be a character witness suggests, without thinking more deeply about the testimony, that the defendant must be innocent. Lawyers understand that jurors respond to association, and they may attempt to exploit this heuristic.

The adaptive value of the heuristics described here in the trial environment is relatively unexplored terrain. It may be that system characteristics are at least as responsible as human failings in leading jurors astray. In particular, in most cases one side has no interest in having a jury get at the truth. It is not surprising that decision makers can be misled by skillful attempts to do so. But even in situations where adversaries have little say, such as jury instructions in American courts, the system may, both procedurally (e.g., instructions delivered orally with no note-taking allowed) and substantively (e.g., instructions using convoluted legal language), work to complexify rather than simplify the jury's task.

Expert Witnesses and Credibility Assessments

In American law, findings of fact such as credibility judgments are the exclusive domain either of the jury or, in bench trials, of the judges. However, in Germany and other civil law countries, psychologists acting as expert witnesses are routinely called in by courts to testify about the credibility of written testimonies. It is interesting to see whether experts, similar to lay jurors, use simple heuristic strategies or whether they make more complicated judgments.

Expert psychologists use a method known as "Statement Validity Assessment" (SVA, also referred to as "content analysis") to assess the semantic content of written testimonies. In Germany, SVA is an influential piece of evidence, which can affect the outcome of the case if no other incriminating or exonerating evidence is available (Steller and Köhnken 1989). SVA is also used in the U.S. as a "lie detection" tool to assist with police investigations. Consistency analysis is one essential component of the three-stage process of SVA. It involves a comparison of witness testimonies made at successive interviews with an eye to contextual features such as consistencies, inconsistencies, omissions, and additions. Although lawyers, police officers, and laypeople, use the consistency between repeated statements as an indicator of the credibility and reliability of a testimony, research in this area is scarce (see Granhag and Strömwall 2001).

Recently, a study took a closer look at consistency in the context of expert witnesses' decision making and their use of consistency cues in SVA analyses. The expert psychologists studied analyzed the consistency of repeated narratives and made judgments about the credibility (veracity) of the narratives (Piperides 2002). The narratives were based on true experiences and false statements, which were repeated after a one-year interval. The analysis showed that a

simple model with only one significant discriminating cue—inconsistencies present in the core events of narratives—best described *both* positive and negative credibility judgments. It appears then that experts, similar to laypeople acting as jurors, use heuristics rather than more complex strategies in legal decision making. In the simulated environment, unlike in real-life settings, expert performance could be measured against an external criterion (i.e., the actual veracity of the statements made). Experts' overall accuracy rate in classifying narratives was only 66%. More specifically, true statements were classified well, but false statements were strongly underestimated. However, as mentioned above, consistency analysis is only one part of the analyses required by SVA. Further steps are needed to gather all the information necessary before making final credibility evaluations. Perhaps, expert performance improves when all the necessary credibility cues are available. Further, it could be that when a decision task consists of separate decision components, some hybrid decision-making strategy is used: Perhaps, information that is gathered in a fast and frugal heuristic manner in each separate stage of the decision-making task is subsequently integrated in an optimal way to reach the final decision.

In conclusion, there are many reasons why legal decision makers might behave in a fast and frugal way: First, they have to make complicated decisions within task constraints, such as vague laws, limited information, time pressure, lack of outcome feedback. Second, as humans, they are also constrained by their own cognitive limitations, and consequently, may have problems computing weights and integrating information or organizing complex inferences. Finally, social factors might come into play, such as passing the buck or social loafing (i.e., if individuals in groups perceive that they will not be evaluated by others, they may experience diminished responsibility regarding a decision task). Assuming that decision makers, in fact, do use simple decision strategies, one may ask whether they *should* do so. In other words, what is the prescriptive utility of heuristics in the legal system? We address this issue later in this chapter.

Appeal Process

However, let us first look at the final stage of litigation. After the judge or jury has reached a decision, an appellate process may ensue. Litigation in civil law countries might be conceptualized as an ongoing trial with highly integrated parts, in which appellate judges provide close supervision of inferior judges on questions of law and fact, all the way up the chain. Common-law appellate processes, by contrast, might be better characterized as a series of judgments at different steps in the process as to the appropriateness of the proceedings below them. However, much of the following considerations apply equally or at least to a somewhat lesser degree to appellate review in civil law countries as well.

Common-law countries make a sharp distinction between questions of law and questions of fact. This is especially true in the U.S. because of the presence

of jurors. Fact-finding by jurors is insulated from careful appellate scrutiny, and even fact-finding by first instance judges is more difficult to reverse than is their law determinations. Thus, in the U.S., a series of rules referred to as “standards of review” have developed that simplify decision making, although it is not clear whether these should be thought of as heuristics. Fact-finding by jurors is reviewed under the “clearly erroneous” standard, which means that it must be accepted, unless no reasonable person could have reached the result the jury did. Since a jury verdict must be unanimous in federal litigation (and have the consent of at least two-thirds of the jurors in state litigation), the probability that there would be so many irrational people together in the same room is quite low, and thus, there are very few reversals of fact-finding by jurors. Fact-finding by judges sitting without juries is reviewed under a “deferential” standard. What this is supposed to mean is that the trial court must have been unreasonable, although it need not be the case that no reasonable person could have decided as the trial judge did. Courts in the civil law world follow a similar approach when they are called to review the decision of their professional colleagues made at a lower level. In German law, the boilerplate formulation of the standard of review is that the lower court must have observed the presumptions and rules of evidence, such as *res ipsa loquitur*, applicable to the case at hand and that its reasoning must not be in conflict with the received laws of nature and common logic. The primary explanation for these rules is that each stage in the appellate process is less well situated than its predecessor to find the facts accurately; the appellate judges, for example, do not observe the witnesses. The secondary explanation is that different parts of the process do different things. Trials find what happened, trial judges and first appeal judges straighten out the law, and the highest courts are more concerned with policy.

These standards continue throughout the appellate level, and indeed, a new one is added at the Supreme Court level. The Supreme Court often says (but occasionally deviates from) that it will not reconsider a fact passed on by two lower courts. Still, as a case proceeds up the appellate chain, the facts become stylized and often bear only a tangential relationship to the richness of the factual matrix at trial. Questions of law are handled quite differently. The general rule followed by courts of civil law jurisdictions is that questions of law will be reviewed in full, as it is the primary function of the appellate courts to guarantee the equal application of the law and to promote the development of the law. Most appeals in the U.S. focus on jury instructions, as they embody the law that is supposedly applicable to the case. The comprehensibility of jury instructions often arises in psychological research, but it should be noted that jury instructions play at least one other important role in addition to informing the jury. They are the means by which hierarchical relationships between courts are maintained. Jurors do not decide questions of law; they find the facts and apply the law to them. However, one cannot analytically separate questions of law from questions of fact. As a result, we find a series of rules and guidelines that allocate decisional authority. As

to what are determined to be questions of law, appellate judges are just as well, and perhaps better, situated to decide these than inferior judges, and thus no deference to prior decision making is provided. The standard of review on appeal is thus said to be “de novo”—or starting anew.

In terms of the usefulness of heuristics, if anything referred to above is one, a few implications are clear. First, these rules attempt to simplify decision making and to delineate institutional roles. Second, there are perverse effects that might arise. If a judge thinks a factual mistake was made, but cannot reverse given the standard of review, he or she may stretch the law to find a legal error so that the case can be sent back for a new trial, or whatever. Other potentially heuristic-like aids to decision making exist that can be summarized in the “duty to preserve error.” To appeal an issue, the parties must first ensure that it was appropriately raised at trial, and second, that claims of error were appropriately made. As the appellate process unfolds, a party that wishes to appeal to the next level must again be sure to preserve the issue by articulating and briefing it for the court. Failure to do any of these things, at any level, will typically result in the party having “waived” or “forfeited” the issue. This can plainly be thought of as a simplifying heuristic.

The appellate process involves a rich set of interactions between individual and collective decision making. In one sense, a single trial judge can “review” the decision of a jury by considering whether to direct a verdict, or enter a judgment as a matter of law, or order a new trial. Appellate courts are always multi-member bodies, reviewing the findings of law of the trial judge, and operate on a majority vote—a decision rule that may be viewed as a heuristic, if indeed it simplifies or shortcuts deliberations. Civil and common-law countries differ in one important respect that maps onto this variable as well. Published dissents are allowed and are frequent in common-law countries, whereas they are virtually nonexistent in Europe. In the civil law world, the number of judges hearing a case is a function of the stakes of the dispute, on the one hand, and the position of the court within the chain of appeals on the other. The further one moves up the chain, the more judges participate in decision making; and, the higher the stakes of a dispute, the more judges will take care of it even at the level of first instance.

PRESCRIPTIVE UTILITY

When making legal decisions, decision makers must consider the ramifications of their decisions for both the individual defendant and for society. They must work within the relevant legal guidelines, the constraints of their task, and within their own cognitive capacities. Furthermore, legal decision making must serve legal goals or ideals. Thus, any comprehensive understanding of the role of heuristics in litigation needs to take these factors into account when considering their usefulness and when offering prescriptive advice. First, however, it is

necessary to understand what the legal ideal practice is, namely what the “normative” model for legal decision makers is.

Legal Ideals

Various theoretical frameworks have been developed to help describe, explain, and evaluate the manner in which legal decisions are generally made, and how the criminal justice system operates (see e.g., King 1981; Packer 1968). Packer’s (1968) due process and crime control models make a statement regarding the function of the criminal justice system and the goals and roles of the agencies operating within the system. Both models represent ideal types, or, in Packer’s (1968) terms, “normative” models that lie on two opposite ends of a continuum.

The crime control model minimizes the adversarial aspect of the judicial process. It is recognized that there are only limited resources available for dealing with crime. Thus, there is an emphasis upon efficiency, speed, and finality. Packer (1968) described the system operating as a crime control model like an “assembly-line conveyor belt” where individuals are screened at each stage (p. 159). By contrast, the due process model places the adversarial aspect at the centre of the justice process. An “obstacle course” is placed along the process, and there is “an insistence on formal, adjudicative, adversary fact-finding processes, in which the factual case against the accused is publicly heard by an impartial tribunal and is evaluated only after the accused has had full opportunity to discredit the case against him” (Packer 1968, pp. 163–164). The due process model “resembles a factory that has to devote a substantial part of its input to quality control,” and so, the manner in which cases are dealt with is deemed more important than the quantity of cases dealt with (Packer 1968, p. 165).

Therefore, it is evident that legal decision making is not necessarily related to discovering the truth or making the “correct” decision. For instance, a trial does not establish whether the defendant is innocent of the offense he or she has been charged with, but whether the evidence is sufficient, beyond reasonable doubt, to establish guilt. Legal decision-making tasks are probabilistic. For example, the question of whether or not a defendant would offend if released on bail cannot be perfectly predicted by the information available (e.g., the seriousness of the offense the defendant is charged with). There are two types of error that could result: Type-I error (e.g., conviction of a truly innocent defendant) and Type-II error (e.g., acquittal of a truly guilty defendant). The inverse relationship between the two types of errors means, for example, that minimizing the probability of making a Type-I error maximizes the probability of making a Type-II error. Packer (1968) pointed out that the crime control model prioritizes the conviction of the guilty, at the risk of also convicting the innocent, while the due process model prioritizes the acquittal of the innocent at the expense of also acquitting the guilty. King (1981) thus notes that the social function of the crime

control model is to deal out punishment, and by contrast, the due process model functions to serve justice.

In reality, most legal systems are currently based on both due process and crime control principles, although most legal policy makers and practitioners would assert that they aspire to the latter (e.g., see Galligan 1987). Indeed, common notions of justice are synonymous with due process.

Should Legal Decision Makers Use Heuristics?

In this volume, Arkes and Shaffer argue that judges should be given cognitive aids, and Koehler proposes that jurors should be given training. In so doing, these authors implicitly assume that legal decision makers should not be using simple heuristics. Yet, can heuristic strategies work well in the litigation environment and, if so, should they be used? Clearly, any prescriptive advice must be made in relation to the ideal practice that we aspire to and must acknowledge the external environmental constraints and internal cognitive constraints faced by legal decision makers (see Gigerenzer, this volume).

For our purposes, a legal decision maker emphasizing crime control would search and weigh only certain factors compatible with evidence of guilt, and would not integrate evidence of innocence. This reflects a noncompensatory, fast and frugal strategy. By contrast, a decision maker observing due process would search all relevant information, weight and integrate it appropriately to make a balanced decision. He or she would have to consider all the factors legal guidelines lay down. This behavior reflects a compensatory, slower strategy. Thus, if we aspire to the ideal of due process rather than just crime control, legal decision makers using simple heuristics are not serving justice, as we presently know it.

However, cognitive psychological theory and research indicates that as humans, individual legal decision makers have limited cognitive abilities, such as limited memory, attention, and processing capacity. These limitations are magnified in legal environments where legal decision makers often have to interpret complex laws, understand a lot of conflicting evidence, and work under time pressure. Consequently, it is reasonable to assume that under these conditions, they will rely on simple heuristics to make decisions rather than perform complicated calculations. Moreover, social psychological theory and research demonstrates that as social beings, groups of legal decision makers, such as benches of magistrates and jurors, are likely to engage in “loafing” and “groupthink,” and so it is reasonable to assume that they will not rely on complex decision strategies. As Dhami (pers. comm.) noted, these considerations lead us to conclude that psychological reality may not meet legal idealism.

To date, Gigerenzer and his colleagues have measured the value of simple heuristics in terms of their accuracy, speed, and frugality (Gigerenzer et al. 1999). And, they have mainly focused on overall accuracy. In fact, although fast

and frugal heuristics have been initially shown to be accurate in computer simulations or in the lab, there is now evidence demonstrating that people in real-world environments can be accurate using these heuristics. Examples include heuristics in coronary care unit allocation (Green and Mehr 1997), in sports (Gigerenzer 2004; Johnson and Raab 2003), investment (Borges et al. 1999), and social learning (Boyd and Richerson 2001). Of course, since a heuristic is not good or bad per se, but only relative to the environment in which it is applied, heuristic decisions can also go wrong (see Harries and Dhimi 2000). The same dependency holds for each strategy, including complex regression models. A full analysis of the decision maker in his or her environment is required. In many domains, including the legal domain, overall accuracy is not as important as reducing either a type I or type II error (Hammond 1996). Furthermore, people may have other goals such as accountability to consider (Tetlock 1985). Different models may achieve these goals with different levels of success.

Research first needs to address which types of decision strategies best meet different goals, before any conclusions can be drawn about the prescriptive utility of heuristics. For now, any policy implications of findings that psychological reality confronts legal idealism will depend on which side of the fence one sits. On the one hand, if we want legal decision makers to come closer to legal ideals, then perhaps we can train them and aid them. Perhaps we can train judges and jurors to abandon maladaptive heuristics in favor of an approach that is more likely to yield appropriate decisions. Koehler (this volume), for example, suggests that jurors receive comprehensive training in critical legal doctrines and in how to reason with legal evidence. On the other hand, if we want legal ideals to come closer to psychological reality, then we could attempt to adapt the legal task to human constraints and even make our legal ideals more psychologically plausible. This could entail teaching heuristic decision making in law schools.

Should Heuristics Be Used in the Development of Legal Rules?

“There are two ways to react to a world that is becoming more complex: to strive for perfection by designing ever more complex legal rules that govern every aspect of human behavior, or to stop this growth and strive for a few simple and robust legal rules....” (Todd and Gigerenzer 2000, p. 776). By striving for simplicity in law, we might be able to adapt the legal task to human constraints and thereby, perhaps, improve judges’ and jurors’ decision making.

One aim would be to structure the legal environment so that the legal decision task becomes cognitively simpler. The law frequently attempts to simplify the decision-maker’s task—and this motive is often explicit—by establishing bright-line rules, even though it knows this will lead some cases to be misclassified. It excludes irrelevant evidence, which in theory should have no implications for the decision, because if fact finders do not need to sort the

relevant from the irrelevant their task is simpler and less costly to accomplish. It establishes statutes of limitations, which means that fact finders do not have to resolve cases where the most probative evidence may well have disappeared or had its signal dulled by the passage of time. When this is not a danger, rules may change and limitation periods may be extended to be tried whenever the accused is identified. (For example, recently in the U.S., there have been “John Doe” indictments in rape cases about to be extinguished where the defendant is identified from a DNA sample.) Finally, as we have mentioned, some principles that decision makers have used as heuristics are embedded in rules so that they no longer have to think about the issue. For example, hearsay is excluded in Anglo-American jurisdictions rather than simply taken as a sign of unreliability.

A further aim might be to structure the legal environment to get the decision maker to use heuristics that promote legal values. More importantly, the aim might be to get the decision maker to not use heuristics that violate legal values. For example, as we have seen in discussing juries, representativeness is a heuristic that lawyers use to manipulate jurors’ decision making. Thus, in criminal cases, they will instruct clients to get a shave and haircut, dress neatly, etc. so they do not look like a stereotype of a criminal. The prosecutors, on the other hand, will often find ways to call a jury’s attention to discrepancies between the way a defendant looks on the stand and the way he or she ordinarily dresses or is groomed. By prohibiting facts that distract from charge-specific evidence, such as “character evidence,” courts attempt to counteract the representativeness heuristic (see Korobkin, this volume).

Fikentscher (pers. comm.) refers to heuristics that play a role within the framework of making or implementing social norms (such as legal, moral, behavioral, religious rules) by simplifying them. “Simplifying heuristics” reduce the content complexity of such norms thereby making norm application more transparent. They may also simplify the sanction side of such norms: Every norm consists of a set of requirements under which a set of facts is subsumed, and a sanction that results in a change of the facts. Simplifying the requirements is more interesting in the present context. In law, the simplifying task is part of what is called “the concretion of a norm for the preparation of its application.” Concretion is indispensable for both Continental code law and for Anglo-American case law (Cardozo 1921). The following is an example of the prescriptive utility of simplifying heuristics: In recent years, the European Court of Justice and the E.U. Court of First Instance, in a series of cases, refused to sustain antitrust complaints against monopolistic behavior and other restraints of competition, raised by the E.U. Commission, on grounds of “lack of economic evidence.” In some camps, this caused a call for “economizing E.U. antitrust.” However, to other observers and antitrust experts, the demand for more “economic evidence” in E.U. antitrust is excessive, consumer-hostile, industry lobby-influenced, and aping the U.S. economic analysis of antitrust law policies. It is obvious that the industry and the legal profession favor complicated

requirements. Max Weber called this phenomenon *Herrschaftswissen* (dominance knowledge).

In searching for perfection in complexity, we are not recognizing the psychological reality of the decision maker. Would we expect a physically handicapped person to be productive and effective in an environment that has not been accommodated to his or her special needs? By using heuristics for the development of legal rules, we are modifying the environment to accommodate the decision-makers' limitations. In addition, by understanding the heuristics humans draw on, we can design the legal system so that legal decision makers who apply familiar heuristics in reasoning will be led to better rather than worse decisions.

HEURISTICS IN LITIGATION: WHAT HAVE WE LEARNED SO FAR?

In the spirit of the adaptive heuristics identified by Gigerenzer and the ABC Group, we hoped to find legal heuristics that were fast and frugal, that performed well, and that furthered the law's objectives. However, our task proved to be too ambitious. Perhaps, we did not succeed in "shooting the game," but we did find the area where it lives and these are the borders:

- Heuristics are mental shortcuts that simplify and speed up decision making at the different stages of litigation, and they can be found at various stages of the litigation process.
- Some parts of the litigation process are clearly not heuristic and here elaborate fact-finding and complex deliberations seem to be more appropriate.
- We will have shot the game if we can show that legal heuristics not only result in speedy and economical justice, but also, that these heuristics serve legal ideas at least as well as more complex and costly economic rules.

Though we may not have succeeded in this last goal, we have pointed to instances of heuristic use throughout the litigation process. We identified heuristics in the formal rules of law and heuristics used by the legal participants from case selection through the appeals process. We have thus delineated the perimeters of an interesting and potentially useful field of research.

Pertinent questions will include not only whether heuristics are used, but also what the role of heuristics is in balancing the competing goals of justice, namely, to protect the individual's right to liberty and to protect the public's right to safety. On the one hand, if heuristic decision making leads to violations of principles such as fairness, lawfulness, and consistency, then we need to reconsider and restructure the role of the decision makers. The aim would be to reduce reliance on naturally occurring heuristics by devising appropriate cognitive aids (see Arkes and Shaffer, this volume), by targeting heuristic manipulations through legal instructions, and by offering relevant educational training. On the other hand, if heuristic decision making furthers the law's objectives, then we

want to facilitate heuristics that lead to “good” (i.e., accurate and fair) decisions and discourage those that do not. The aim would be to restructure the legal environment so that the heuristics used are adaptive.

Indeed, research must specify the conditions under which heuristics can be adaptive in the legal environment. A heuristic will allow one to draw “accurate” conclusions only if it uses relevant, unambiguous, and valid cues that are good indicators of the underlying legal fact. Whether heuristics work well or poorly does not simply depend on the heuristic. It also depends on the relationship of the heuristic to the decision environment. Where there is a good fit between heuristic and environment, “rational” results are likely. Thus, when considering heuristic performance, we need to study a wide range of environments, especially when we want to speculate about performance in the relatively unexplored legal environment. For example, although we have seen heuristics perform well in simulations that deal with problems with good feedback, it is less clear that heuristics will perform well in real-world environments where good feedback is typically absent. However, the same limitation holds for complex strategies.

In most cases, the overall decision-making task of the court will remain a complex one even if some of the decision processes are simplified. If we insist on perfection, we can ignore human reality and try to complexify the decision process even further. Yet if legal judgments and choices were not made unless and until they were demonstrably optimal, the system would be brought to a standstill. In the end, it seems clear that heuristics play a central role in the production of legal rules and decisions. We anticipate that future research will shed light on this role.

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REFERENCES

- Babcock, L., and G. Loewenstein. 1997. Explaining bargaining impasse: The role of self-serving biases. *J. Econ. Persp.* 11:109–126.
- Borges, B., D.G. Goldstein, A. Ortman, and G. Gigerenzer. 1999. Can ignorance beat the stock market? In: *Simple Heuristics That Make Us Smart*, by G. Gigerenzer, P.M. Todd, and the ABC Research Group, pp. 59–72. New York: Oxford Univ. Press.
- Boyd, R., and P.J. Richerson. 2001. Norms and bounded rationality. In: *Bounded Rationality: The Adaptive Toolbox*, ed. G. Gigerenzer and R. Selten, pp. 281–296. Dahlem Workshop Report 84. Cambridge, MA: MIT Press.
- Brunswik, E. 1952. *Conceptual Framework of Psychology*. Chicago: Univ. of Chicago Press.

- Cardozo, B.N. 1921. *The Nature of the Judicial Process*. New Haven, CT: Yale Univ. Press.
- Chapman, G.B., and B. Bornstein. 1996. The more you ask for, the more you get: Anchoring in personal injury verdicts. *Appl. Cog. Psychol.* **10**:519, 525–528, 532–533. *Commonwealth v. Dunkle*, 602 A.2d 830, 835 n. 16 (Pa. 1992).
- DePaulo, B.M., K. Charlton, H. Cooper, J.J. Lindsay, and L. Muhlenbrock. 1997. The accuracy–confidence correlation in the detection of deception. *Pers. Soc. Psychol. Rev.* **1**:346–357.
- Dhmi, M.K. 2003. Psychological models of professional decision-making. *Psychol. Sci.* **14**:175–180.
- Dhmi, M.K., and P. Ayton. 2001. Bailing and jailing the fast and frugal way. *J. Behav. Dec. Mak.* **14**:141–168.
- Finucane, M.L., A. Alhakami, P. Slovic, and S.M. Johnson. 2000. The affect heuristic in judgments of risks and benefits. *J. Behav. Dec. Mak.* **13**:1–17.
- Galligan, D.J. 1987. Regulating pre-trial decisions. In: *Criminal Law and Justice*, ed. I.H. Dennis, pp. 177–202. New York: Sweet and Maxwell.
- Gigerenzer, G. 2004. Striking a blow for sanity in theories of rationality. In: *Models of a Man: Essays in Memory of Herbert A. Simon*, ed. M. Augier and J.G. March, pp. 389–409. Cambridge, MA: MIT Press.
- Gigerenzer, G., P.M. Todd, and the ABC Research Group. 1999. *Simple Heuristics That Make Us Smart*. New York: Oxford Univ. Press.
- Granhag, P.A., and L.A. Strömwall. 2001. Deception detection based on repeated interrogations. *Leg. Criminol. Psychol.* **6**:85–101.
- Green, L.A., and D.R. Mehr. 1997. What alters physicians' decisions to admit to the coronary care unit? *J. Fam. Practice* **45**:219–226.
- Hammond, K.R. 1996. *Human Judgment and Social Policy: Irreducible Uncertainty, Inevitable Error, Unavailable Injustice*. New York: Oxford Univ. Press.
- Harries, C., and M.K. Dhmi. 2000. On the descriptive validity and prescriptive utility of fast and frugal models. *Behav. Brain Sci.* **23**:753–754.
- Hastie, R., D.A. Schkade, and J.W. Payne. 1999. Juror judgments in civil cases: Effects of plaintiff's requests and plaintiff's identity on punitive damage awards. *Law Hum. Behav.* **23**:445, 462–463.
- Hibbard, R.A., and G.L. Hartman. 1992. Behavioral problems in alleged sexual abuse victims. *Child Abuse Negl.* **16**:755–762.
- Hogarth, R.M., and H.J. Einhorn. 1992. Order effects in belief updating: The belief-adjustment model. *Cog. Psychol.* **24**:1–55.
- Johnson, J.G., and M. Raab. 2003. Take the first: Option generation and resulting choices. *Org. Behav. Hum. Dec. Proc.* **91**:215–229.
- Kahneman, D.J., and S. Frederick. 2002. Representativeness revisited: Attribution substitution in intuitive judgment. In: *Heuristics and Biases*, ed. T. Gilovich, D. Griffin, and D. Kahneman, pp. 49–81. New York: Cambridge Univ. Press.
- Kahneman, D., and A. Tversky. 1974. Judgment under uncertainty: Heuristics and biases. *Science* **185**:1124–1131.
- King, M. 1981. *The Framework of Criminal Justice*. London: Croom Helm.
- Lyon, T.D., and J.J. Koehler. 1996. The relevance ratio: Evaluating the probative value of expert testimony in child sexual abuse cases. *Cornell Law Rev.* **82**:43–78.
- Packer, H.L. 1968. *The Limits of the Criminal Sanction*. Palo Alto: Stanford Univ. Press.
- Payne, J.W., J.R. Bettman, and E.J. Johnson. 1993. *The Adaptive Decision Maker*. New York: Cambridge Univ. Press.

- Pennington, N., and R. Hastie. 1991. A cognitive theory of juror decision making: The story model. *Cardozo Law Rev.* **13**:519–557.
- Piperides, C. 2002. Expert Witness Use of Consistency Cues: Judging the Veracity of Adult Testimonies. Master's thesis (Diplomarbeit), Dept. of Psychology, Freie Universität Berlin, Berlin, Germany.
- Polya, G. 1957. *How to Solve It*. 2d ed. Princeton, NJ: Princeton Univ. Press.
- Priest, G.L., and B. Klein. 1984. The selection of disputes for litigation. *J. Legal Stud.* **13**:1–55.
- Simon, H.A. 1955. A behavioral model of rational choice. *Q. J. Econ.* **69**:99–118.
- Steller, M., and G. Köhnken. 1989. Criteria-based statement analysis. In: *Psychological Methods in Criminal Investigation and Evidence*, ed. D.C. Raskin, pp. 217–245. New York: Springer.
- Tetlock, P.E. 1985. Accountability: The neglected social context of judgment and choice. In: *Research in Organizational Behavior*, ed. B. Staw and L. Cummings, vol. 7, pp. 297–332. Greenwich, CT: JAI Press.
- Todd, P.M., and G. Gigerenzer. 2000. Précis of simple heuristics that make us smart. *Behav. Brain Sci.* **23**:727–780.

