
PSYCHOLOGY'S IMPORTANT INTERLUDE PERNICIOUS IMPACT ON SUBJECTIVE PROBABILITY AND PAYOFF PREDICTIONS

Decision tree analysis is only as sound as the judgment that informs its subjective estimates of probabilities and dollar outcomes. These estimates are, by definition, inexact. No one can accurately predict the future all of the time. Presumably, an expert is valued because her education and experience mean that her estimates, though unavoidably subjective will be more accurate, more of the time. The lawyer is the expert on law and legal process. Thus, decision analysis in a legal context has reason to rely on a lawyer's best judgment given the facts and the law in the particular case. We cannot expect more or less than that.

Still, lawyers are human. A robust body of research establishes that humans—lawyers included—are subject to psychological impediments that distort or block access to what otherwise might be their expert judgments. As these impediments can affect any prediction or estimate, it seems most efficient to describe them in this interlude. My intent is to provide a common foundation and sensibility for later discussion of challenges, choices, and best practices in assessing and eliciting subjective estimates of probabilities and outcome predictions.

Reckoning with the Psyche's Impediments to Sound Prediction¹

Thoughtful, informed, and deliberate analysis is a best practice for just about any endeavor, with possible exceptions in romance and immediate danger. In the context of analyzing legal problems, best practices must be designed around what are very common, well-known impediments to optimal analysis.

¹ Much of this discussion is drawn liberally from Chapter 5 in Aaron, Marjorie, *Client Science: Advice for Lawyers on Counseling Clients Through Bad News and Other Legal Realities* (2012), which includes references to important primary and secondary sources. Too much experimental and empirical research exists confirming the power of human bias in decision-making to cite it here. This discussion of psychological biases includes citations only for highly specific references. Those who wish to delve deeper into the impact of bias, and indeed, other ways that psychology impacts lawyers' thinking, are encouraged to read: Robbennolt, Jennifer K. and Sternlight, Jean R., *Psychology for Lawyers: Understanding the Human Factors in Negotiation, Litigation and Decision* (2013). Research specific to lawyers' decisions regarding settlement and trial can be found in Randall, Kiser, *Beyond Right and Wrong: The Power of Effective Decision Making for Attorneys and Clients* (2010), drawing upon research reported in Kiser, Randall L.; Asher, Martin A.; and McShane, Blakeley B. "Let's Not Make a Deal: An Empirical Study of Decision Making in Unsuccessful Settlement Negotiations," *Journal of Empirical Legal Studies* 5, no. 3 (2008): 551-591.

Another important piece of research at the top of this non-exhaustive list is: Goodman-Delahunty, Jane; et al., "Insightful or Wishful: Lawyers' Ability to Predict Case Outcomes," *Psych., Pub. Pol'y. & L.* 16, no. 2 (2010):133-157.

What are these impediments? It's fair to group them into two broad categories, even if not entirely unrelated: (1) egocentric and partisan perception biases and (2) the tendency to anchor on an initial number or position. They impede optimal analysis because of their power to distort, bending one's thinking and conclusions away from clearheaded, unbiased, unanchored versions. Some elaboration on these impediments and their impact on decision-making is provided below, as well as ways to counteract or adjust for them.

Egocentric and Partisan Perception Biases

Most of us are partial to ourselves, so it seems right to discuss egocentric biases first. One of the most robust findings in psychology is that people tend to have inflated, optimistic, positive assessments of themselves and their own likelihood of success.² Particularly relevant for the lawyer-tree builder, even professionals tend to be overly confident that their better-than-average intelligence and professional skills will bend the odds in their favor. Research indicates that this effect worsens when a decision must be made under time pressure.³

Back to decision trees: when assigning percentages to branches on his decision tree in a case, the lawyer will consider how he would frame the argument on summary judgment or build his case through witnesses or in summation at trial. The client will think about his own role as an important witness. Particularly where their performances will directly impact a critical juncture, egocentric biases may lead to distorted probability estimates. We forget that the other side's lawyer has won a few cases in his time or that their key witness might also be described as charismatic.

² Garrison Keillor, originator and recently retired host and star of Minnesota Public Radio's much beloved radio show (broadcast nationally through NPR), *Prairie Home Companion*, long told weekly stories from his Minnesota hometown, "Lake Wobegon, where the women are strong, the men are good looking, and all of the children are above average." Given Mr. Keillor's retirement, the "above average" quality of Lake Wobegon's children may not be as universally recognized in the future as it is today. Author Kathryn Schulz refers to this as "the Lake Wobegon Effect" in *Being Wrong: Adventures in the Margin of Error* (2011): 106; see also Dunning, David; Heath, Chip; and Suls, Jerry M., "Flawed Self-Assessment: Implications for Health, Education, and the Workplace," *Psychological Science in the Public Interest* 5, no. 3 (2004); Dunning, David et al., "Why People Fail to Recognize Their Own Incompetence," *Current Directions in Psychological Science* 12, no. 3 (2003): 83–87 (describing research that indicates most people are not adept at judging their limitations and greatly overestimate their own talent and expertise). This footnote discussion is also drawn from Aaron, *Client Science*.

There are simply too many sources confirming that "experts" in a field are generally subject to the same range of cognitive psychological biases in estimating probabilities and outcomes and in confidence levels as non-experts, though sometimes to lesser degrees. One antidote is repeated feedback such as weather forecasters receive on a daily basis. A good summary of the research through 1980 is found in Lichtenstein, Sarah; Fischhoff, Baruch; and Phillips, Lawrence, "Calibration of probabilities: The state of the art to 1980," in Kahneman, Daniel; Slovic, Paul; and Tversky, Amos (eds.), *Judgment under uncertainty: Heuristics and biases* (1982): 306–335. It's fair to say that the vast majority of subsequent published experimental research confirms experts' susceptibility to anchoring, the representativeness heuristic, over-confidence, tightness of range and all the rest, even if tempered in some instances.

³ Study 2 of Epley, Nicholas; Boaz, Keysar; Van Boven, Leaf; and Gilovich, Thomas, "Perspective Taking as Egocentric Anchoring and Adjustment," *Journal of Personality and Social Psychology* 87, no. 3 (2004): 327–339.

Entrenchment by Judgmental Over-Confidence

A Chinese proverb wisely observes: “To be uncertain is to be uncomfortable, but to be certain is to be ridiculous.”⁴ Yet, the egocentric bias known as “judgmental overconfidence” is prevalent in human psychology. Assume a defense lawyer predicts his summary judgment motion will succeed. If he claims to be “ninety-five percent sure”, judgmental over-confidence is likely exerting its influence. He has made a predictive (and optimistic) judgment and he is also confident of that judgment. Research confirms that attorneys tend to be overconfident about often inaccurate predictions.⁵

Tree-builders should be aware that overconfidence tends to increase after making a judgment or committing to a choice. The classic experiment at a Vancouver racetrack makes the point. Experimenters asked prospective bettors about their level of confidence before and after placing bets on their favorite horse. The bettors were more confident after betting; yet the horses had not gotten any faster!⁶ After making a strategic litigation or settlement choice, lawyers and clients may become more confident. We will no doubt reassess after new information or important pre-trial rulings. However, these adjustments are often insufficient, again due to perception biases, overconfidence, and the power of anchoring (the latter to be discussed shortly).

The Lawyer's (or Client's) Partisan Position

Separate from egocentrism, our partisan positions cause us to filter information and then evaluate it differently than a neutral party would.⁷ We fall prey to “biased assimilation of information” and “selective perception” of the information acquired. In short, we are inclined to absorb and value information supporting our positions and discount or ignore countervailing evidence.

A plethora of research shows partisan perception bias

It's important to know that lawyers are subject to this bias notwithstanding professional obligations to be “objective”.⁸ Most are not particularly competent at predicting how a neutral decision-maker—judge, jury, or arbitrator—will rule. In a landmark study comparing trial attorneys' predictions and later reported trial results, University of California Professor Elizabeth Loftus and Leiden University Professor Willem Wagenaar found that, as a whole, the attorney participants were over-confident and inaccurate

⁴ Aaron, *Client Science*, 154.

⁵ Loftus, Elizabeth F. and Wagenaar, Willem A., “Lawyer's Predictions of Success,” *Jurimetrics* 28 (1988).

⁶ Knox, Robert E. and Inkster, James A., “Postdecision Dissonance at Post Time,” *Journal of Personality and Social Psychology* 8, no. 4 (1968): 319-323.

⁷ One explanation is that people perceive and interpret the world through knowledge structures or “schemas.” These affect what we observe and remember. Failure to observe what runs counter to our schemas may rise to “unintentional blindness.” For further references and more detailed discussion, see Chapter 5 in Aaron, *Client Science*, 143-144.

⁸ Goodman-Delahunty, et. al., “Insightful or Wishful,” 133-157.

When assessing probabilities of favorable rulings by a judge or jury, the decision analyst should be aware of a study finding that socio-political attitudes biased the way state court judges and law students evaluated research on capital punishment. It seems that knowledge of an assigned judge's social and political leanings may be a significant factor in your assessment. Redding, Richard E. and Reppucci, N. Dickon, “Effects of Lawyers' Socio-political Attitudes on Their Judgments of Social Science in Legal Decision Making,” *Law and Human Behavior* 23, no. 1 (1990): 31-54.

predictors. More highly confident lawyers were not more accurate.⁹ A later study confirmed that lawyers' predictions about winning or losing on liability were barely more accurate than chance.¹⁰ Not surprisingly, the author's law school class annually demonstrates partisan perception bias, with wide divergence between defense and plaintiff sides' average estimates of the chances of liability in a business fraud case.

Experience is no antidote; it may even exacerbate the problem. Two separate studies found lower calibration between prediction and results among lawyers in practice for more than thirty years.¹¹ Accuracy reached an average plateau somewhere between six and ten years of practice and continued to thirty years. We can only speculate as to why. Perhaps senior lawyers become entrenched on one side of the practice, handle more difficult cases, or become more over-confident. To all lawyer-readers over fifty, this is a peer's respectful word to the wise.

Further research establishes that the partisan role, not the law degree, is what diminishes our accuracy.¹² This suggests that, where possible, it would be wise for a professional uninvolved in the case (even if it's an in-firm lawyer) to serve as the tree-builder and/or to actively engage in critical dialogue with the lawyer estimating probabilities for his own client's case.

The Bias Blind Spot

Even if aware of such biases, we tend to believe our own judgments are less susceptible to bias than others.¹³ Given the prevalence of optimistic and egocentric biases, this "bias blind spot" is no surprise. After all, we also see ourselves as above average and thus more objective, less self-interested and more moral. It is also consistent with the psychological phenomenon known as "naïve realism": people's tendency to believe their own understanding of the world as simply accurate and conclude that others' views stem from bias or ignorance.

⁹ Goodman-Delahunty, Jane; Granhag, Willem A.; and Loftus, Elizabeth F., "How Well Can Lawyers Predict Their Chances of Success?" Unpublished manuscript (1998), cited in Koehler, Derek J.; Brenner, Lyle; and Griffin, Dale W., "The Calibration of Expert Judgment: Heuristics and Biases beyond the Laboratory" in Gilovich, Thomas; Griffin, Dale W.; and Kahneman, Daniel (eds.), *Heuristics and Biases: The Psychology of Intuitive Judgment* (2002). These sources are also cited in: Kiser, Randall, *Beyond Right and Wrong*, 56 n. 37, and in Aaron, *Client Science*, 156, n. 56. See also: Loftus and Wagenaar, "Lawyer's Predictions of Success."

¹⁰ Goodman-Delahunty, Jane et al., "Insightful or Wishful."

¹¹ For more complete discussion, see Kiser, Randall, *Beyond Right and Wrong: The Power of Effective Decision-Making for Attorneys and Clients* (2010) and the initial research article the book builds upon: Kiser, Randall; Asher, Martin; and McShane, Blakeley, "Let's Not Make a Deal: An Empirical Study of Decision Making in Unsuccessful Settlement Negotiations," *Journal of Empirical Legal Studies* 5, no. 3 (2008): 551–591.

For a shorter summary, see Chapter 5 in Aaron, *Client Science*.

¹² In the influential book by Kelvin Jr., Harry and Zeisel, Hans, *The American Jury* (1971), the authors reported on research in which more than 500 judges in 400 civil jury trials recorded their opinions of the cases' difficulty and how they should be decided, before learning the jury verdicts. Judges agreed with the jury's verdict 78 percent of the time. Kiser makes the point that this 78 percent agreement is higher than most expert-to-expert agreements in other fields. Kiser, *Beyond Right and Wrong*, 18. When they disagreed, judges would have ruled for the plaintiff 10 percent of the time and for the defense 12 percent of the time—a statistically even balance. Many other studies have yielded strong findings of judge and jury agreement.

¹³ For an extended discussion and influential research into the bias blind spot, see Ehrlinger, Joyce; Gilovich, Thomas; and Ross, Lee, "Peering in to the Bias Blind Spot: People's Assessments of Bias in Themselves and Others," *Personality and Social Psychology Bulletin* 31, no. 5 (2005): 680–92.

Judgmental Anchoring

Judgmental anchoring—a previously considered number's influence on a numeric judgment—also critically impacts best practices for decision analysis. Much like an anchor pulls a boat in its direction, our first number—that first guess or reference point data, even if obviously wishful—pulls our subsequent numerical judgments up or down.

It's fair to say that anchoring is another one of the most robust, consistently demonstrated phenomenon in research on psychology and decision-making, across a variety of domains.¹⁴ It doesn't matter if the anchor number is plausible or implausible, is known to be from a partial or impartial source,¹⁵ or is entirely irrelevant to the problem. Novices and experts alike are subject to anchoring, in both laboratory and real-world experimental conditions.¹⁶

I can't avoid temptation to describe the first demonstration of anchoring, as it illustrates the concept in its purest form. In 1974, Professors Amos Tversky and Daniel Kahneman performed their classic experiment,¹⁷ in which a "Wheel of Fortune" type roulette wheel was spun in various business school classes. The wheel had secretly been preset to the number 10 or 65. The students were asked to estimate the percentage of African countries in the United Nations. For classes in which the roulette wheel spun to 10, the average estimate was 25 percent and for classes in which the wheel spun to 65, the average estimate was 45 percent. Clearly the preset wheel numbers were powerful anchors, despite their obvious irrelevance to the question.

My own and law professor colleagues' numerous informal anchoring experiments consistently confirm what a psychology professor would anticipate: the phenomenon is alive and well among lawyers and law students. Each year in my client counseling class, I ask law students to estimate damages and recommend settlement for an employment discrimination case. The case is described in some detail on a document that also references an unrelated personal injury case with vastly different awards. Each year, the students' damages estimates and recommended settlements are strongly anchored by the numbers in the unrelated personal injury case. Similar informal experiments with experienced counsel yielded the same results: damages estimates and settlement recommendations were strongly anchored by numbers in a logically unrelated case. Why does anchoring work? It has been suggested that when someone is anchored, they selectively search for and activate information consistent with it.¹⁸ And, even

¹⁴ See, Smith, Andrew R. and Windschitl, Paul D., "Biased Calculations: Numeric Anchors Influence Answers to Math Equations," *Judgment and Decision Making* 6, no. 1 (2011): 139-146, and George, Joey F.; Duffy, Kevin; and Ahuja, Manju, "Countering the Anchoring and Adjustment Bias with Decision Support Systems," *Decision Support Systems* 29, no. 2 (2011): 195-206.

¹⁵ See Chapman, G.B.; and Johnson, E.J., "Incorporating the irrelevant: Anchors in judgments of belief and value," in Gilovich, Griffin, and Kahneman (eds.), *Heuristics and Biases: The Psychology of Intuitive Judgment*. For comprehensive discussion and citation to numerous sources on this issue, see Epley, Nicholas, and Gilovich, Thomas, "The Anchoring and Adjustment Heuristic: Why the Adjustments Are Insufficient," *Psychological Science* 17, no. 4 (2006): 311-18.

¹⁶ Smith and Windschitl, "Biased Calculations," and Whyte, Glen, and Sebenius, James K., "The Effect of Multiple Anchors on Anchoring In Individual and Group Judgment," *Organizational Behavior and Human Decision Processes* 69, no. 1 (1997): 74-85.

¹⁷ Tversky, Amos and Kahneman, Daniel, "Judgment under uncertainty: Heuristics and biases," *Science*, New Series 185, no. 4157 (1974): 1124-1131.

¹⁸ Epley and Gilovich, "The Anchoring and Adjustment Heuristic" (citing to numerous sources).

if we adjust from that anchor by considering additional information or arguments, we resist or underweight these in comparison. Thus, we tend to adjust insufficiently.

It doesn't require much imagination to see how a lawyer conducting decision analysis in his client's case could be anchored by his own or his client's partisan perception biases in estimating liability percentages. Imagine the tree-builder putting the question to a defense lawyer: "So, what are the chances of winning that summary judgment motion and knocking out this case?" Without much thought and with some bravado, the lawyer may throw out a number, "I'd say 80%." When discussing the probability of a plaintiff's verdict, the defense client or lawyer may say, with exasperation, "ZERO percent—5 percent—it shouldn't be more." Before any reasoned discussion, an anchor has been set in place. Surely, intelligent people adjust for new information! It would seem reasonable to think that intelligent people undergo thought processes to adjust from an anchor, whether internally or externally generated. Unfortunately, a considerable body of experimental research agrees and confirms that, while people tend to adjust somewhat, their adjustments are generally insufficient to achieve accuracy.¹⁹

Anchoring, Adjustment, and Underestimating Damages

Not surprisingly, psychology impacts our estimates of possible outcome values in a similar way. Mediators will attest that it's not uncommon to hear counsel estimating likely damages in the same case, roughly as follows: Plaintiff's counsel asserts: "The jury will most likely come back at \$500,000 in our case—that's what I see as the mid-point." Yet, in the other caucus room, defense counsel reassures his client: "If we do lose, a verdict wouldn't be more than \$150,000 or so." For them to arrive at these widely divergent numbers (based on shared factual information), some combination of optimism, selective perception, or biased assimilation of information is operating in at least one, if not both rooms. Their estimates may also have been influenced or anchored by external numbers:²⁰ the newspaper report of a million-dollar verdict in a fraud case or one lawyer's experience with a stingy jury's low verdict in a personal injury case. Whatever the source, these articulated numerical estimates then become anchors affecting subsequent movement, expectation, and decisions.

Evidence of Defense Blind Spot and Underestimation²¹

Research suggests that defense lawyers are particularly prone to underestimating dollar amounts of damages exposure.²² A comprehensive 2008 study comparing final settlement offers and demands and trial results in 5,653 civil cases found that, while plaintiffs were somewhat more often mistaken about

¹⁹ Scholars seem to agree that the limits to adjustment are what might be thought of as the "outer edge" of the judge-estimator's reasonable range, but from his own (biased) perspective only. Imagine a lawyer has been asked to judge the likelihood of winning the case. He names "65%" as his best guess. Internally, perhaps unconsciously, he feels that a reasonable range is 55% - 75% (still with 65% as his best estimate point). As he learns more information, or is asked to consider arguments or perspectives of the other side, he will adjust, but only to the edge of his (biased) range—only to 55%. For more information on the insufficiency of adjustments, see Epley and Gilovich, "The Anchoring and Adjustment Heuristic."

²⁰ See Epley, Nicholas; Keysar, Boaz; Van Boven, Leaf; and Gilovich, Thomas "Perspective Taking as Egocentric Anchoring and Adjustment," *Journal of Personality and Social Psychology* 87, no. 3(2004): 327-339.

²¹ "Word to the Wise" section is excerpted from Aaron, *Client Science*, 157-158.

²² Kiser, Randall, *Beyond Right and Wrong*, drawing upon the research originally published in Kiser, Asher, and McShane, "Let's Not Make a Deal."

winning on liability, the average gap between the last offer and the ultimate award was seventeen to nineteen times higher on the defense side than on the plaintiff's side. This strongly suggests widespread defense failure to recognize damages exposure in the event of a plaintiff's verdict, or, at least, failure to account for that exposure in case valuation and settlement offers.

Experimental research also supports the observation that defense lawyers tend to estimate low jury awards, at least in the personal injury area.²³ In one experiment, plaintiffs' and defense lawyers, judges, and jurors were presented with descriptions of personal injury cases and asked to rate the severity of the injury and an appropriate level of award. (Liability was not at issue.) The results: when respondents had no partisan stake in the outcome, there was considerable consistency in the way they analyzed injury severity and thought about awards. However, the largest deviation was found between defense lawyers and all other participants. Defense lawyers tended to rate described injuries as less severe, resulting in lower awards.

I cannot resist noting that unpublished data generated in my annual law school negotiation course suggests that defense tendencies to under-estimate damages exposure begin early. As reported earlier, when law students and their business school clients estimate the likelihood of a plaintiff's verdict in a case of alleged breach of contract and business fraud, both sides display typical partisan perception bias. More striking is that defense-side estimates of damages in the event of plaintiff's verdict have averaged between 10% and 25% of the plaintiff side estimates—four to ten times lower—based upon the SAME spreadsheet numbers on business revenues and projections, etc. My suspicion is that the trial attorneys as well as the law students and clients tend to conflate the likelihood of a defense verdict and the measure of its consequences. In other words, they internally discount any very, very large number by some certainty that it will not happen. It's a hidden double discount. They fail to think through what the highest dollar verdict might be if the jury finds liability and all aspects of the trial go badly.

All of this leads to some important advice for the defense side in particular: beware of unrealistically low verdict estimates. Don't conflate the likelihood of a defense verdict and the measure of its consequences. Remember that your hundredth personal injury claim will be the jury's first. What might the award be if, against the odds, a jury, judge, or arbitrator rules against your client? One mediator (not to mention the defendant) still ruminates on the \$40 million-dollar jury award in a case where, in a mediation caucus with the defense, the notion of damages exposure beyond a few million had been waived away as "silly." Don't fail to consider the worst-case scenario.

On Exposure and Wider Range

Even in opinion letters or case assessment discussions devoid of formal decision tree analysis, defense lawyers are appropriately called upon to estimate "worst case exposure" and plaintiff's lawyers are asked to say how high or low the award could be.

Leaving bias aside, our entirely normal tendencies are to describe these ranges too narrowly; we fail to imagine all possible outcomes.²⁴ In short, we are prey to the general "tightness of range" prob-

²³ Wissler, Roselle et. al., "Decision Making About General Damages: A Comparison of Jurors, Judges, and Lawyers," *Michigan Law Review* 98 (1999): 751 & 805.

²⁴ Prior research regarding over precision caused by failure to adequately consider all possible outcomes of an event is discussed and a method to mitigate the failure was proposed and tested by Haran, Moore, and Morewedge

lem identified by Professors Raiffa and Alpert in 1969. In their classic experiment, large numbers of Harvard Business School students (all familiar with decision analysis!) were asked to provide extreme range estimates for five independent categories or “almanac type” information, including the “percentage of students (who drink) and who prefer bourbon to scotch,” and the “number of eggs produced in the United States in 1965.” The subjects were divided into four subgroups: one was asked to estimate numbers at 1% and 99% of the range, the second group at .1% and 99.9%, the third at the extreme ends of the verbal range “minimum possible value” and “maximum possible value,” and the fourth group at “astonishingly low” and “astonishingly high.”

The experiment sought to learn how large the “surprise index” would be. Or, stated more accurately, it was designed to see how well calibrated our estimated ranges are to actual ranges. Theoretically, there “should” have been only 2% surprises—a surprise index of 2—outside of the actual range—in the first group, and .2% for the second group. (Remember that at either end of a 1% and a 99% range, 1% of results would be lower and 1% would be higher, a total of 2% of results outside the parameters of the range.) In fact, Raiffa and Alpert’s experiment yielded a surprise index of 46 for the 1%/99% group and 40 for the .1%/99.9% group. The other two groups had surprise indexes of 47 and 38. This paper spawned a vast number of additional, related experiments and literature on the question of calibration and expertise when subjective probabilities and numerical range estimates are required.²⁵

In summary, overwhelming evidence establishes that when we ask people to assess ranges using fractiles—markers at particular percentage points along a range of possible outcomes—they come up with ranges that are too tight. To see what this means in practice, imagine that we ask the following questions to an experienced trial lawyer acting as a neutral consultant in a personal injury case:

- Name a jury verdict number that is at 99% of the possible range; you are confident that if liability were certain and the case were tried 100 times—the verdict would be lower than that number, 99% of the time.
- Can you answer the same question, but at 75%, then at 50%, 25% and finally, 1%?

The research predicts that the lawyer-expert’s numerical estimates would set out a range that is too narrow for each segment, and particularly at the extreme ends.²⁶ In other words, the range would not be well-calibrated to realities.

Of course, in a litigation setting, even these realities are theoretical. There is no almanac data; this case will not be tried 100 times. And yet, research as well as anecdotal evidence suggests that lawyers are too often “surprised” by jury awards outside of ranges they had seen as possible.²⁷ The author ruefully recalls two recent cases in which jury verdicts came back at multiples of the defense’s and the mediator’s

in their article, “A Simple Remedy for Overprecision in Judgment,” *Judgment and Decision Making* 5, no. 7 (2010): 467–76. Their experiment involved weather predictions, and the method they called SPIES (Subjective Probability Interval Estimates) required judges to consider a full range of possible temperatures, broken up into intervals, and then assign probabilities to each interval (with total probabilities not to exceed 100).

²⁵ See Alpert, Marc and Raiffa, Howard, “A progress report on the training of probability assessors” and Lichtenstein, Fischhoff, and Phillips, “Calibration of probabilities: The state of the art to 1980,” in Kahneman, Slovic, and Tversky (eds.), *Judgment under uncertainty: Heuristics and biases*, 294-305 and 306-334.

²⁶ Epley, Nicholas and Gilovich, Thomas, “Putting Adjustment Back in the Anchoring and Adjustment Heuristic: Differential Processing and Self-Generated and Experimenter-Provided Anchors,” *Psychological Science* 12, no. 5 (2001): 391-396.

²⁷ See Kiser, et. al, “Let’s Not Make a Deal,” 566-568, 585-586, and 589-590.

highest estimate. Thus, all are advised to play with imagining the worst and the best of all possible outcomes (depending on your perspective) and testing their impact on the decision tree.

The good news is that some but not all studies indicate that training, cautionary instruction, and particularly feedback as to accuracy may reduce the problem.²⁸ So, for example, weather forecasters tend to have high calibration rates because they receive feedback on their predictions literally every day. Unfortunately, the bad news is that most trial lawyers don't receive such frequent feedback.

Raiffa and Alpert's further research to determine the impact of new information and training on people's range estimates is relevant to the tree builder seeking to elicit legal analysis that encompasses all legitimately predictable verdict ranges.²⁹ Their work shows that when new information enters the picture, people do expand estimated ranges, but not enough. When people adjust, we move incrementally, grudgingly, and often insufficiently from where the anchor has set in our emotional, psychological mud.³⁰

Elicitation for the Full Possible Range

Given all of this, what questions should a tree-builder ask when setting up ranges on a tree?

This question—about which questions to ask—lands us in realm of “elicitation” studies in the field of statistics. These studies posit that there is an “expert” who possesses knowledge and a legitimately formed opinion. The analyst's challenge is to elicit in a way that faithfully yields the expert's opinion.³¹ This is a challenge because experts too are prey to the same psychological heuristics and biases as the rest of us. Successful “elicitation” is designed to mitigate the impact of these heuristics and biases and thus their distortions of the expert's true opinion. Elicitation research seeks to learn how the analysis-elicitor—can best design questions and dialog for successful elicitation.

²⁸ Classic articles asserting the effectiveness of feedback on accuracy include: Lichtenstein, Sarah and Fischhoff, Baruch, “Training for Calibration,” *Organizational Behavior and Human Performance* 26 (1980): 149-171; and Kioriat, Asher; Lichtenstein, Sarah; and Fischhoff, Baruch, “Reasons for Confidence,” *Journal of Experimental Psychology: Human Learning and Memory* 6 (1980): 107-118. A good summary is also provided in Lichtenstein, Fischhoff, and Phillips, “Calibration of probabilities: The state of the art to 1980,” in Kahneman, Slovic, and Tversky (eds.), *Judgment under uncertainty: Heuristics and biases*. See discussion of the research and of their experiment in providing feedback in the form of accurate answers to initially posed questions in Arkes, Hal; Christensen, Caryn; Lai, Cheryl; and Blumer, Catherine, “Two Methods of Reducing Overconfidence,” *Organizational Behavior and Human Decision Making Processes* 39 (1987): 133-144.

²⁹ Alpert, Marc and Raiffa, Howard, “A Progress Report on the Training of Probability Assessors,” in Kahneman, Slovic, and Tversky (eds.), *Judgment under uncertainty: Heuristics and biases*, 294-305. Increasingly available databases that provide access to jury verdict for all state and federal courts (including patent litigation) may also offer a reality check on dollar ranges that have been awarded in past cases. Some of these databases and analytic services are discussed more fully in this text's Chapter Eleven.

³⁰ Overprecision resulting from a failure to adequately consider all possible outcomes of an event is described in and tackled by Haran, Uriel; Moore, Don; and Morewedge, Carey, “A Simple Remedy for Overprecision in Judgment,” *Judgment and Decision Making* 5, no. 7 (2010): 467-76.

³¹ Garthwaite, Paul; Kadane, Joseph; and O'Hagan, Anthony, “Statistical Methods for Eliciting Probability Distributions,” *Journal of the American Statistical Association* 100 (2005): 680-701. The authors write that: “Elicitation is the process of formulating a person's knowledge and beliefs about one or more uncertain quantities into a (joint) probability distribution for those quantities.” This piece is also available through Semanticscholar.org at <https://www.semanticscholar.org/paper/Chapter-1-Elicitation-Garthwaite-Kadane/d213d8252de5f77a55980ee8e15eb16506f31a4c>.

For decision analysis or risk analysis in a legal context, the “elicitor” could be the non-lawyer decision analyst, a tree-builder lawyer or mediator; the expert(s) could be the lawyer on the case or a lawyer or former judge called in to consult on the merits. Presumably the lawyer (or legal team) would be the most knowledgeable about the facts, evidence, witnesses, legal issues and so forth.³² As a practical matter, the tree-builder and the expert may often be the same lawyer.

How then, is the tree builder best advised to ask the lawyer (even if it's himself) about his estimates of a possible jury verdict range in a way that avoids or mitigates “tightness of range”?

One option is for the tree builder to ask that the lawyer, in effect, establish the quartiles. In other words, ask: “Is there a verdict amount that's ‘smack dab’ in the middle, a point at which you would predict the actual number would be lower half the time, and higher half the time if, hypothetically the case were tried a hundred times?” That becomes the median.³³

Those who have studied psychology or absorbed lessons in this “Interlude on Psychology” may be concerned about the anchoring effect of that median number. Fair point. In fact, that mid-point number is likely to serve as an anchor. For that reason, it's best to avoid naming a mid-point before thorough consideration and discussion of the facts, evidence, emotions, and law that will impact a verdict in the case.

The reason to elicit the number is that some research suggests somewhat less over-confidence—less anchoring close to the mid-point number and somewhat wider confidence ranges—when the expert generates that number, than if it was externally introduced. Still, given our awareness of the strong tendency toward anchoring and tightness of range, some skepticism seems warranted.

On the other hand, depending upon his or her role, the tree builder may deliberately choose to introduce or suggest the median point (or any other points) in hope of an anchoring effect, even recognizing a tightness of range concern. Consider the mediator tree builder, who may fairly be characterized as “negotiating from the middle.” The mediator may want to name a (neutrally assessed and neutrally motivated) number and ask if that might be the median jury verdict. Perhaps the mediator's suggested numbers will mitigate the lawyer's tendencies toward partisan bias, at least in naming the midpoint.

Whatever the stated median, the next question might be: “Assume a verdict number higher than that, at what number would we likely be ‘halfway up the high side?’ In other words, at what number would 75% of the verdicts be lower and only 25% higher?” and so forth, until reaching the farthest ends of the range—99% and 1%.³⁴

³² Of course, in practice, tree builder may also be the lawyer in his client's case. If so, elicitation is reflexive: the tree builder's dialog is with her own lawyerly self.

³³ See Block, Richard and Harper, David, “Overconfidence in Estimation: Testing the Anchoring-and-Adjustment Hypothesis,” *Organizational Behavior and Human Decision Processes* 49 (1991): 188-207.

³⁴ In fact, this author has been introduced to quite a hyper-technical body of research literature on elicitation of expert opinions as to probabilities, values, and ranges so as to avoid their common psychological biases and judgment errors. By way of example (and to mine their references), see Garthwaite, Kadane, and O'Hagan, “Statistical Methods for Eliciting Probability Distributions,” Fischhoff, and Phillips, “Calibration of probabilities: The state of the art to 1980,” in Kahneman, Slovic, and Tversky (eds.), *Judgment under uncertainty: Heuristics and biases*, and Winkler, R.L.; Hera, S.C.; and Baca, R.G, “The Quality of Experts' Probabilities Obtained Through Formal Elicitation Techniques,” Center for Nuclear Waste Regulatory Analyses (1992).

Another option would be to start by eliciting extreme ends of a hypothetical range: “What jury awards are the highest or the lowest you could imagine?” You might ask the lawyer to name an extremely high hypothetical award amount at which he is 99% sure the actual award will be lower or to name an extremely low award amount at which there’s only a 1% chance it would ever be lower. Then, and only then, would the tree builder ask the lawyer to estimate the probability of numerical points or chunks within that range, or to estimate the 50% median.

Theoretically, to avoid common conservatism, the elicitor could also name some extreme numerical points and ask if they could fairly be considered at 90%, 95% or even 99% of the range. Of course, that assumes the elicitor is better equipped to predict the extremes, which may not be true.

Research suggests that before eliciting numbers or percentages, it’s important to engage in thought exercises for both unfavorable and favorable extremes.³⁵ Much time should be spent discussing and listing the many factors that might break for the other side—“What would the perfect storm look like?”—and then all of the ways things could go well.³⁶ In short, before making any numerical or percentage estimates, do imagine the circumstances that might give rise to extreme outcomes in either direction. This thought exercise is likely to lead to fewer “surprises” in the form of actual results that fall outside of the anticipated range.

Value and Risk of Frames³⁷

This interlude’s final segment on “Value and Risk of Frames” offers insights from psychology for communicating with clients about decision trees numerical inputs and calculated values in legal settlement contexts.

The way a lawyer frames choices to a client can greatly influence the client’s response. If a choice is framed as a loss, we are more likely to choose a risky alternative; if it’s framed as a gain, we are more likely choose to keep it rather than risk it. Of course, most choices can be seen from multiple perspectives. Whether described or felt as a loss or a gain depends on expectations, goals, and context.

These insights derive from an impressive body of research in the field of psychology. Original credit is due to Professors Tversky and Kahneman, who first articulated the now widely accepted, tenets of “prospect theory³⁸” regarding the ways most people respond to risk, gain, and loss:

³⁵ This advice derives from studies regarding scientific data and quantifiable, knowable outcomes of numerous trials. The problem is that one recommendation—for the elicitor to state the known or knowable extreme numerical ranges and ask the expert to name the percentage likelihood of outcomes along those ranges—is not realistic in our context. This author is doing the best she can to extrapolate advice from some of this literature, or at least to avoid bad advice.

³⁶ See Flannelly, Laura and Flannelly, Kevin, “Reducing People’s Judgment Bias About their Level of Knowledge,” *The Psychological Record* 50 (2000): 587-600. This is just one among many reports of experimental research demonstrating that active consideration of the counter-arguments, negative factors, or the opposite view tends to reduce biases and over-confidence.

³⁷ This discussion of Prospect Theory and its application for client counseling is largely excerpted or paraphrased from Chapter 5 in Aaron, *Client Science*, which contains a vast number of citations. As is true for the balance of this interlude, readers are also directed to the Sternlight and Robbenalt, *Psychology for Lawyers*.

³⁸ Tversky, Amos and Kahneman, Daniel, “The Framing of Decisions and the Psychology of Choice,” *Science* 211, no. 4481 (1981): 454. For additional explanations of Prospect Theory, see Plous, Scott, *The Psychology of Judgment and Decision Making* (1993); and Kahneman, Daniel and Tversky, Amos, “Prospect Theory: An Analysis of Decision Under Risk,” *Econometrica* 47 (1979): 263-291.

- 1) People tend to be risk-averse as to significant gain.

Once we have gained something we are often loath to give it up in favor of a relatively strong chance of getting more. Preference for the “bird in the hand” over the “bird in the bush” is the operative aphorism. This is true even when the “rational” choice—in terms of mathematically discounted value—is to take the risk. Thus, most people prefer a sure gain of \$240 over a fifty percent chance of winning \$500. Different people’s breakpoints will be different. I might settle for \$175, or even \$150, or less. Others might take no less than \$200, and be comfortable with rolling the dice. And a few will insist upon every penny of the mathematically discounted value that is \$250, or even more.

- 2) People tend to be risk-seeking as to significant loss.

We hate to pay up and declare defeat right now. When people are given a choice between a 75% chance of losing \$1,000, or just paying \$750 (or, I suspect, \$740 or even \$700), most will choose to roll the weighted dice. We would rather not choose loss, particularly current loss, if it can be delayed.

It turns out that tables are turned for insignificant gains and losses. When an offer is extremely low, we become risk seekers, choosing to roll the dice for the long shot high dollar win. Consider a \$10,000 offer, based on 5% chance of \$200,000. If the offer was a mere pittance to the client (no impact on cash flow, etc.), he won’t experience regret at its loss. And he might like to put the defense to the test. On the other side, people would rather pay a bit more than discounted value to avoid the small chance of enormous loss. Thus, a defense client faced with a 5% chance of that same \$200,000 loss might be willing to pay more than the economically rational \$10,000. Why? People are sometimes willing to pay a premium for certainty and peace of mind. And we are motivated to avoid regret. The defendant may be happy to over pay a bit (more than discounted risk value) to avoid entirely the fear of having to pay \$200,000, particularly if that would severely impact his business or career.

- 3) People tend to prefer positively framed choices—certain gains from a reference point—over choices involving risk.

Affirming the expression “a bird in the hand beats two in the bush”: most of us an opportunity for sure gain over a chance to win considerably more, if that chance comes with the risk of winning nothing. As discussed earlier, when offered \$100 as a no-risk gain or the chance to play a coin toss game with a 50% probability of winning \$210, \$220, or \$250 (or perhaps more), most people will choose the \$100. If potential winnings are high enough, most of us would indeed accept the risk and toss the coin. The important observation is that the exact 50% discounted value would not usually be the indifference point. That’s particularly true where the scale of the numbers becomes higher and we would anticipate great regret over turning down a high “bird in the bush” number and then losing at the risky game.

- 4) People tend to prefer choices involving risk over negatively framed alternatives—certain losses from a reference point.

Experimental research in legal contexts and more broadly has established Prospect Theory’s validity: whether an offer is framed positively as a gain or negatively as a loss from a salient reference point

impacts the likelihood of its acceptance or rejection. Literature in law and psychology is replete with examples, so I've opted to stick to the early, classic experiments on point.

First, Professors Kahneman and Tversky gave subjects two sets of choices between alternative programs to combat an outbreak of a dangerous disease which originated in Asia expected to kill 600 people. The first group was asked to choose between Program A that would save 200 people and Program B that would have a 1/3 probability of saving 600 people and a 2/3 probability of saving no one. A second group of respondents were asked to choose between Program C, in which 400 people would die, or Program D, that would have a 1/3 probability of no one dying and a 2/3 probability that 600 people would die.

Professor Max Bazerman later conducted a similar experiment³⁹ in which participants were given parallel choices regarding a financially troubled company, with three manufacturing locations and 6,000 employees, 2,000 at each location. First, participants were asked to choose between Plan A, that would save 2,000 jobs and one of the manufacturing plants, and Plan B, that would have a 1/3 chance of saving all of the manufacturing plants and all of the jobs. Next, they were asked to choose between Plan C that would result in the loss of 4,000 jobs and 2 two of the three 3 manufacturing locations, and Plan D, that would have a 2/3 chance of losing all of the manufacturing plants and all of the jobs.

In both experiments, the vast majority chose Plan A, and then Plan D. If you read the problem carefully, this makes no sense. Plans B and D are the more risk-seeking. So, internally consistent risk seekers should choose B and D. Plans A and C have certain outcomes. Those who prefer certainty should prefer these plans in both instances. Why do people choose inconsistently? The answer is in the framing: Plan A is framed around the positive—SAVING lives or KEEPING jobs, so it is preferred to B. But Plan C is framed around the negative—CERTAIN LOSS of lives or jobs—and so taking risk with plan D is preferred. The identified reference point determines the frame—whether you view an option as a loss or a gain—and that impacts your decision.

All lawyers should be aware of Prospect Theory and how word choice may influence clients in one direction or another. Yet, it's true that if the lawyer, empathizing with his client, emphasizes loss from a targeted settlement, the client is less likely to accept it. Consider this well-meaning but negative framing by the lawyer: "Well, I know we talked about a possible verdict at trial of \$500,000 to \$600,000, with a lot of risk. And that's why we had a targeted settlement at \$300,000 or so, when we met before the settlement conference. But unfortunately, it looks like the most we can get the defendant to pay is \$195,000, that's \$100,000 or so less. But if we don't take that, we'll have to roll the dice."

Prospect theory and abundant research tell us that a client is likely to respond differently if the lawyer says: "I know a frustration we've had is that the defense hadn't offered us a dime before today. And I know we talked a lot about the risk of a defense verdict, in which case you would not get anything; your lost wages and other expenses wouldn't be covered. On the other hand, this offer of \$195,000—maybe we can get it up to a round \$200,000—would just be yours—no risk, under your control, and it would

³⁹ See Bazerman, Max, "The Relevance of Kahneman and Tversky's Concept of Framing to Organizational Behavior," *Journal of Management* (1983): 1-3; and summary and sources cited in Aaron, *Client Science*, Chapter 5. Note that countless additional experiments—too numerous to cite here—have confirmed the basic tenets of Prospect Theory.

cover expenses and more. Payment could no doubt be processed in a week or so. Or, we could turn it down, say no, and roll the dice.”

These reference points—expectations, target numbers, out-of-pockets, the last offer before mediation—will be familiar to any litigator or mediator involved in settlement discussions. As it happens, decision tree analysis generates an array of different and potentially salient numerical points, including the final EMV or discounted value, the EMVs at various intermediate branch clusters, and sometimes, within the range of possible outcomes tied to cumulative probabilities.

As discussed later, these can become reference points around which to frame an offer. “Higher than the EMV” may feel like a gain or a great deal for the plaintiff; “\$X lower than the EMV” can be framed as a great deal for the defense. It can also be characterized as a currently “owned” opportunity, a gain that will be lost after summary judgment is denied, when the EMV (and the plaintiff’s position) will clearly be higher.

The Representativeness Heuristic Distorts Reality

“In making predictions and judgments under uncertainty, people do not appear to follow the calculus of chance or the statistical theory of prediction. Instead they rely on a limited number of heuristics which sometimes yield reasonable judgments and sometimes lead to severe and systematic errors.”⁴⁰ One of these heuristics is “representativeness.” The more a person or circumstance is “representative” of what I’ll call an archetype, the more we are likely to predict their fit with an archetypal story or outcome. This is true even where logic and evidence tell us that story or outcome is rare.

In Kahneman and Tversky’s classic experiment, sixty-nine subjects were asked to consider the percentage of all first year graduate student in the US that were enrolled in each of nine fields of specialization. This question generated a set of “base rates”—an estimated distribution of graduate students across different fields. A second group of sixty-five subjects were presented with a personality sketch of “Tom W” and asked how similar Tom W was to the typical graduate student in each of the following nine fields of graduate specialization. A table was generated indicating how close or how far Tom W was from being “similar” to a typical student in these fields.

Finally, a predication group of 114 psychology graduate students was given Tom W’s personality sketch,⁴¹ and told that it was written during his senior year in high school by a psychologist on the “basis of projective tests”. Those graduate students in psychology knew this type of test to be highly unreliable (particularly from high school). And yet, more than 95% of predictors judged Tom W more likely to study computer science than humanities or education, even though there were many, many more graduate students in these fields. In 1973 or so, the time of this research, 20% of graduate students were estimated to be in Humanities and Education, 17% in Social Science and Social work, 15% in Business Administration, and 12% in Physical or Life Sciences—to name the major categories. Only 7% of graduate students were estimated to be in Computer Science. Yet, our predictors of Tom W’s field ranked the

⁴⁰ Kahneman, Daniel and Tversky, Amos, “On the psychology of prediction,” in Kahneman, Slovic, and Tversky (eds.), *Judgment under uncertainty: Heuristics and biases*, originally published in *Psychological Review* 80 (1973): 237-251. This section’s summary of the representativeness heuristic is based upon and drawn from Kahneman and Tversky’s chapter, referenced in this note.

⁴¹ In fact, following the prediction, the predictors were asked to estimate the likelihood of such a projective test being accurate. They rated the accuracy as 23%—holding such tests in low esteem.

likelihood of his being in computer science as much higher, despite the overall “base rates” or prevalence of other fields, because Tom W’s personality profile matched or “represented” their characterization of a computer science student. This was true even where they knew personality profiles to be unreliable.

This experiment, as well as similar subsequent experiments, established a very strong correlation between similarity and prediction. The more a subject was similar to, or “representative of,” a certain category or type, the stronger people’s prediction that he belonged.

What makes this a problem? And how does it relate to probability estimates for decision tree analysis in a legal case? Fair questions! The “representativeness heuristic” is a problem because it makes us inaccurate predictors under accepted rules of probability. Representativeness causes us to ignore the impact of base rates—the overall likelihood or prior probabilities—on the probability we seek to estimate.

Explanation of Bayesian Bedrock as Back-Up for Prescriptive Advice

To include an explanation of Bayes’ Theorem, or not to include it? That was a question your author debated. Whether to skip this rather technical, even intimidating topic so as not to lose the more typical lawyer reader, or to include it to maintain some credibility with the statistically astute?

After much internal deliberation, I decided to include it with the caveat that non-mathematically inclined readers can skip it without guilt. All you really need to know is: mathematics and statistics provide analytical proof that the representative heuristic tends to distort our subjective probability judgments; and work with base rates can adjust for this distortion.

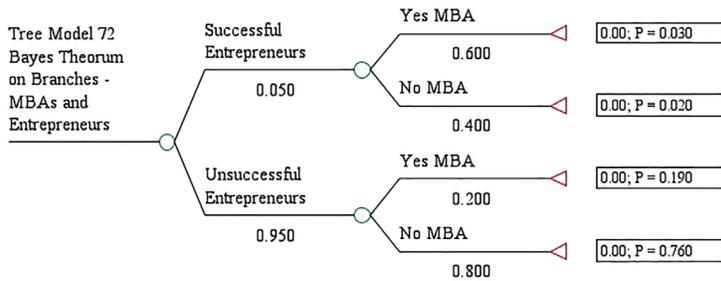
If, and only if this prelude discussion has managed to intrigue you, please do consider the following discussion of Bayes’ Theorem and its role in subjective probability.

Bayes’ Theorem is yet another bedrock rule of probability theory. Also known as Bayes’ Rule, it can be thought of as a formal rule about the optimal—mathematically accurate—way to revise probability assessments in light of evidence. It states that accurate prediction requires us to take prior probabilities into account, as well as “conditional” or “posterior” probabilities. When Kahneman and Tversky write that “people do not appear to follow the calculus of chance or the statistical theory of prediction,” they are pointing to our common failure to follow this rule when formulating subjective probability estimates.

Bayes’ Theorem or Rule can be and often is expressed via mathematical formula. Fortunately, it can also be illustrated with a decision tree.

Imagine we know that 60% of all successful entrepreneurs have MBAs and 40% don’t. Suppose 20% of unsuccessful entrepreneurs have MBAs and 80% don’t.

Suppose 5% of all entrepreneurs are successful. What proportion of MBAs who are entrepreneurs are successful? The answer is NOT 60%!!!



To answer the question: “What % of MBA’s who are entrepreneurs are successful?”, we look to the tree and observe that a total of 22% of entrepreneurs have MBAs—the 19% who were unsuccessful, plus the 3% who were successful. But our question asks the proportion of the successful to the total with MBAs, and that is the 3% successful/ the 22% total = 13.6%.

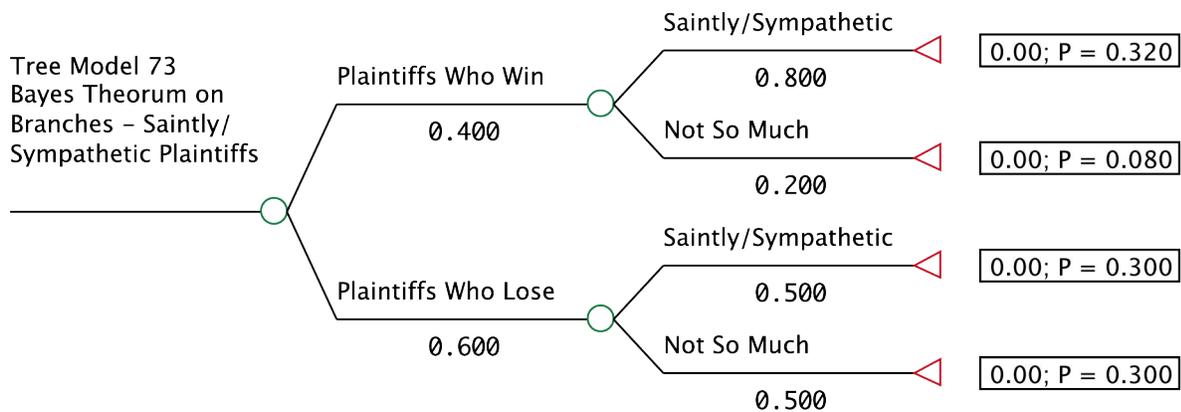
$$\frac{3\% \text{ of entrepreneurs who have MBAs are successful}}{22\% \text{ of entrepreneurs have MBA's (19\% + 3\%)}} = \frac{3}{22} = 13.6\%$$

Consider the following hypothetical example within the realm of assessing the probabilities of legal case outcomes in which a lawyer may tend to use representativeness as a factor.

In an age discrimination case in which the plaintiff absolutely fits the image of “saintly and sympathetic,” the lawyer’s estimate, influenced by the representativeness heuristic, might be that she is 75% or 80% likely to win.

Now let’s imagine that only 40% of all plaintiffs win in age discrimination suits (The 40% has no claim to truth, but it will make the math easier.) Here is how Bayes’ would apply:

40% of plaintiffs win. Of these, 80% appear to be saintly/sympathetic; 20% don’t.
 60% of plaintiffs lose. Of these, 50% appear to be saintly/sympathetic; 50% don’t.



What are the chances that our saintly/sympathetic plaintiff will win?

Well, let's consider that:

- 32% win and are saintly/sympathetic
- 30% lose and are saintly/sympathetic
- 30% lose and are not
- 8% win and are not

Drawing from these results, we see that a total of 62% of plaintiffs appear saintly/sympathetic. Yet only 32% of those who win appear that way.

So, the chance of a saintly/sympathetic plaintiff winning is 32/62—just over 50%.

Put in more colloquial terms, there is a relationship between saintly/sympathetic and the likelihood of winning. If your client is representative of “saintly/sympathetic,” it is appropriate to adjust your subjective probability assessment up from the base rate of 40%. But, it's a more modest bump—not nearly to 75% or 80%.

For certain types of statistical evidence to be introduced at trial, failure to understand, use, and explain Bayes' Theorem may be malpractice. Injustice occurs when the jury is misled by inaccurate or misleading statistics entered into evidence.⁴² That is not our concern here.

The decision analyst and his client DO have strong interests in admittedly subjective probabilities based upon sound judgments and, to the extent possible, uncorrupted by psychological biases. Hence this discussion of the representative heuristic, Bayes' Theorem, and Chapter Eleven's suggestion to research and consider relevant base rates.

Promise, Power, and Practice in Probabilities and Payoffs

This “interlude” sounds an informed warning about lawyers' and clients' psychological tendencies when estimating probabilities and payouts and advises awareness of framing choices when communicating.

If we are such imperfect, biased estimators, what business do we have assigning probabilities and payoffs to decision trees?

For better or worse, it is as much our business to estimate probability and payoffs in numerical terms as it has traditionally been to evaluate a case in prose terms. A lawyer's traditional descriptive evaluation is no more or less subject to the psychological biases outlined earlier. Yet, this prose has long been relied upon to support recommendations and decisions regarding “reasonable” settlement ranges.

Of course, for a decision tree to be analyzed in full, or even used as a reasonably informative map, numbers can't be avoided. Even though numerical probability and outcome estimates are absolutely and unapologetically subjective, their use in decision analysis offers complete transparency. At the very least, corruption by psychological bias is more likely to be seen and critically questioned when reflected in numbers.

⁴² The author hereby acknowledges some ambivalence regarding the decision to place a summary description of Bayes' Theorem in this section. On the one hand, it is linked to the representativeness heuristic; on the other hand, this interlude has been about psychology rather than numbers and probability theory. Fair point. Readers interested in further discussion of the topic are invited to consult just about any text on probability theory.

This interlude was intended to offer research insight and best practice advice for lawyers using decision tree analysis. My hope is that it will inspire humility, rigor, and reflection when we lawyers undertake the critical act of estimating probability and outcome in our clients' cases.