

SECTION 10

Snap Judgments— Risks and Benefits of Heuristic Thinking

How does human decision making work; where does critical thinking fit?

How do cognitive heuristics help and harm strong decision making?



Learning Outcomes

10.1 Explain, using examples, the difference between system-1 and system-2 decision making.

10.2 Explain, using examples, each of the cognitive heuristics described in this section, including its potential benefits and risks.

Many good

judgments we make every day are automatic or reactive, rather than reflective. Consider the ease with which well-trained pilots fly complicated machines safely taking millions of us to our destinations every day. Through training and repetition, veteran pilots have internalized and made automatic a series of complex analyses, inferences, and quick effective judgments that novice pilots often find mentally all-consuming. Automatic reactions are also seen in more “grounded” drivers and in other situations. For example, bike riders often pedal along, paying more attention to the beauty of their surroundings than on shifting gears or maintaining their balance. The process of e-mailing friends is another example. Our fingers tap the keys, but our minds are focused on composing our messages, not on locating the letters on the keyboards. Human beings do not make all their decisions using only their capacity for deliberative reflective thought. Human decision making is more complex.¹ Some judgments, including many good ones, are quick and reactive, not deliberative or reflective. Although some judgments are best made more automatically or reactively, some are best made reflectively.² Our real-life critical thinking question is “Which of our reactive judgments ought we to make reflectively?”

For any of us to maximize our personal potential for developing and applying critical thinking to real-life decision making, we first must understand how human problem solving and decision making function in real life. We know that critical thinking, or reflective purposeful judgment, can and ought to be applied to a very large array of vital issues and important decisions. And we know from our experience that we do not always use critical thinking. The fact that we *do* not use critical thinking does not imply that we *ought* not to be using critical thinking.

This section and the next one focus on the skill of self-regulation, because monitoring our own decision making and correcting our own decision making turn out to be essential. Taking a moment to “stop and think” is excellent advice for every one of us, authors included. We begin this section with a brief synopsis of the cognitive science research on decision making so that we can position critical thinking, and in particular the skill of self-regulation, within that context. We will learn that many reactive judgments are good judgments. But, in some circumstances, reactive judgments can lead to unnecessary risks and mistaken biases. Our work in this section is to use self-regulation to become more aware of those circumstances so we can correct ourselves reflectively, using critical thinking, before we make a mistake.

Our Two Human Decision-Making Systems

Human decision making emerges from the interplay of two cognitive drivers. One is our human propensity toward self-explanation known as argument making. The other driver is the influence on our decision making of mental “shortcuts” known as cognitive heuristics. *Argument making*, as we saw in the previous sections, is the effort to be logical—that is, to rely on the relevant reasons and facts as we see them when making our decisions. In general, humans value making important decisions as rationally as the circumstances, significance, and content of their judgments permit. This is not to say that we are always successful in this effort. In fact, we often are not. And yet we explain our choices and judgments to ourselves, if not to others, in terms of the relevant reasons and facts—again, as we see them. For example, you ask me why I stayed overnight at a friend’s house in another city instead of driving home. I reply that it was late and I was very tired, too tired to drive.

Heuristic thinking is the tendency, which is at times quite useful, of relying on highly efficient and generally reliable cognitive shortcuts when reaching a decision. In the research literature, these mental shortcuts are known as *cognitive heuristics*. These mental maneuvers are as much a part of the human reasoning process as argument making. Cognitive heuristics often enable us to make judgments and decisions more expeditiously and efficiently. Their influences, while often positive, can introduce errors and biases into human decision making.

THE “TWO-SYSTEMS” APPROACH TO HUMAN DECISION MAKING

Research on human decisions made in naturalistic, everyday contexts, describes the interaction of two overlapping decision-making systems.³ One is reactive, instinctive, quick, and holistic (System-1). The other is reflective, deliberative, analytical, and procedural (System-2). Both valuable systems function simultaneously, often checking and balancing each other.

Reactive (System-1) Thinking

System-1 thinking relies heavily on situational cues, salient memories, and heuristic thinking to arrive quickly and confidently at judgments, particularly when situations are familiar and immediate action is required. Many freeway accidents are avoided because drivers are able to see and react to dangerous situations quickly. Good decisions emerging from System-1 thinking often feel intuitive.⁴ Decisions good drivers make in those moments of crisis, just like the decisions practiced athletes make in the flow of a game or the decisions that a gifted teacher makes while interacting with students, are born of expertise, training, and practice. Often we decide first, quickly, and reactively, and then, if asked about our decisions, we explain how we analyzed the situation and we provide the reasons and arguments to explain those snap judgments, which are System-1 decisions. You are suddenly and unexpectedly confronted with an attack dog, you instantly react defensively. It is natural. So what if the owner tries to reassure you with a confident “He won’t bite.” Your system-1 decision making self-protective reaction kicked in, flooding your body with adrenaline and triggering your natural “fight or flee” reaction. If our ancestors had waited around debating what to do when attacked by ferocious carnivorous predators, our species probably would not be around today. Overt explanations using rationalistic argument making in the case of System-1 decisions are retrospective. We look back at what we did and explain the instantaneous System-1 inferences we made at the heat of the moment.



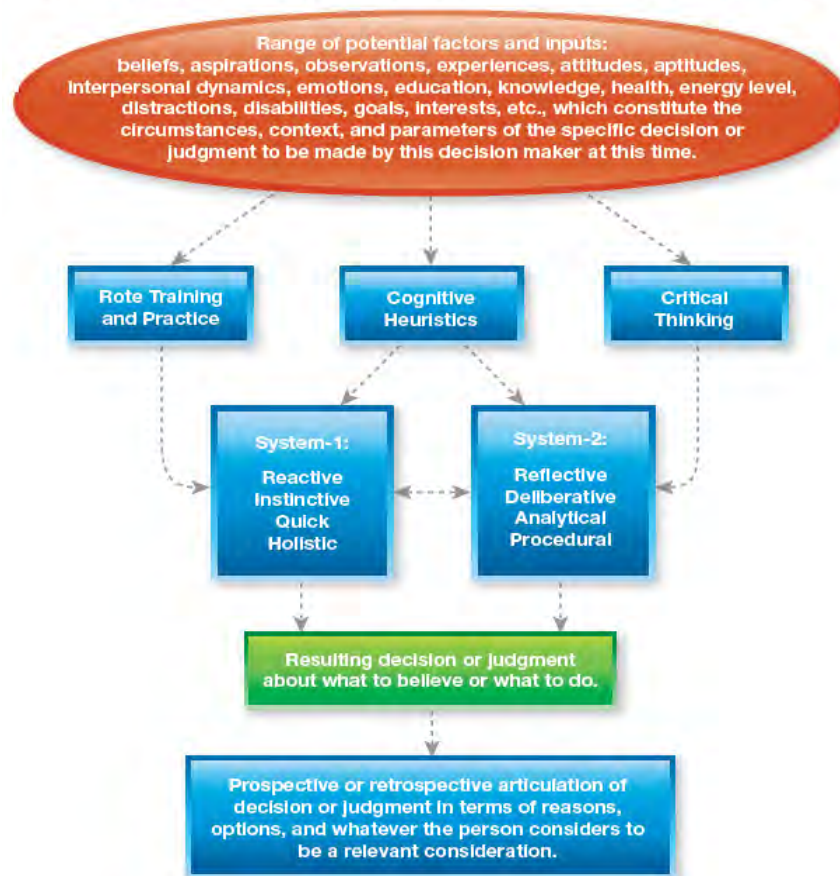
Reflective (System-2) Thinking

System-2 thinking is useful for judgments in unfamiliar situations, for processing abstract concepts, and for deliberating when there is time for planning and more comprehensive consideration. Humans use heuristic maneuvers in System-2 thinking as well, often integrated as components of their logical arguments. Argument making is often part of the inference and deliberation process when making System-2 decisions. And, of course, explanations involve making arguments and giving the reasons we used during our deliberations. When we share our reflective interpretations, analyses, evaluations, and inferences, we are offering explanations. Because of this, critical thinking is self-regulated System-2 thinking. Critical thinking is System-2 thinking focused on resolving the problem at hand and at the same time monitoring and self-correcting one's own process of thinking about that problem.



As you think about the “two-systems” approach, please avoid all the harsh, rigid, stereotypic, divisive, commercialized oppositional, oversimplified, pop culture dichotomies. We are not characterizing human decision making by expressions and false dichotomies such as “emotion vs. reason,” “head vs. heart,” “feeling vs. judgment,” “intuitive vs. logical,” “expansive vs. linear,” “creative vs. critical,” “right brained vs. left brained,” “warm vs. cold,” “from Venus vs. from Mars,” or “blink vs. wide-eyed.” Human decision making is neither this superficial nor this simplistic. We are not saying that normal human thinking is schizophrenic or psychologically disordered in any way. We are not suggesting that some people are only System-1 thinkers while others are only System-2 thinkers.

Model of Two-System Human Decision Making



Normal human beings have and use both systems in problem solving and decision making every day. The two-systems approach to understanding human decision making accounts for the pushes and pulls that normal human beings often describe as part of their decision making. System-1 is the rapid-fire decision making we all experience on some occasions, while System-2 is the more reflective decision making we all experience on other occasions.

Because it is considered more useful for addressing novel and complex problems in a reflective and methodical way, System-2 is the mode of reasoned, informed, and thoughtful problem solving and decision making that a broad undergraduate liberal arts and sciences education cultivates.

System-2 is also the mode addressed by the evidence-based practice and research methods components of one’s professional or graduate studies. All levels of education, which aim at improving one’s critical thinking—improving one’s skills and dispositions to engage successfully in purposeful reflective judgment—is education focused directly on strengthening System-2 problem solving and decision making.

Is the two-systems approach only a helpful way of imagining how our minds work, or is there some basis for it in the neural chemistry of the human brain? In fact, it is the second. Using functional MRI scans scientists can now see the changes in brain activity as a person’s thinking moves from one system to the other during learning.⁵ System-1 processing appears highly reactive, like a reflex automatically triggered by a stimulus. By contrast, System-2 reasoning is described as much more reflective, analytical, mindful, and meta-cognitive. But System-2 can override System-1, which gives all of us hope that our decisions can be more than knee-jerk reactions.

THE VALUE OF EACH SYSTEM

System-1 and System-2 are vital decision-making tools, particularly when stakes are high and uncertainty is an issue. We can often rely on System-1 to get us through our day-to-day activities while engaging System-2 on some other topic of concern. People report they can drive from home to work without remembering any of the hundreds of routine automobile operating decisions necessary to make the trip. Others report being able to drink a cup of coffee and finish a bowl of breakfast cereal almost without noticing because they are so engrossed in the morning news. Have you ever had any of these kinds of experiences in your life—experiences where you did something “without really thinking about it” while your mind was preoccupied with a completely different problem or issue?



System-1: A soldier reacting under fire based on sound training.

We do not store the memories of our System-1 guided actions if we are simultaneously engaged in deliberating about something using System-2. For example, when we are thinking about something else, like a work assignment, a relationship issue, or a financial problem, we are distracted from the simpler System-1 decision making we may be doing, like walking in a familiar place, driving home on a familiar route, or eating lunch. Our mental focus is on the System-2 work, and, during those times, System-1 operates in the background. This is why we may not remember routine System-1 judgments, like why we’ve walked into a room, whether we’ve already passed our freeway exit, or if we’ve already put sugar in our coffee.

System-1 functions in the background or “behind the scenes” more than System-2, but each system is capable of overriding the other. Conflicted decision-making contexts have, through the ages, been described in different ways—“temptation” being only one example. We are drawn one way, but at the same time, pulled the other way. Although we do not accept the implication that the colloquial expressions are scientifically accurate, we can spot oblique references to the behind-the-scenes pushes and pulls of the two systems in the way people ordinarily talk about their decision making. We have all heard people say things like “My gut says to do X, but my brain says to do Y”; “We looked at all the evidence and all the options and yet we don’t feel comfortable with where the deliberations are heading”; or “Emotionally I want to do this, but rationally I think I should do that.” Some theorists suggest these common ways of talking are evidence that, in certain kinds of ambiguous or complex situations, the two systems might conflict, drawing the decision maker in different directions. In general, this is thought to be an advantage that reduces the chance of making poor, suboptimal, or even dangerous errors in judgment—a natural system of checks and balances, as it were.

Even a good thinker makes both System-1 and System-2 errors from time to time. We misinterpret things, overestimate or underestimate our chances of succeeding, rely on mistaken analogies, reject options out of hand, trust feelings and hunches, judge things credible when they are not, etc. Often mistakes like these are directly related to the influences and misapplications of cognitive heuristics. We all share the propensity to use these heuristics as we make decisions, because at times the heuristics seem to be hardwired into our species. Since the critical thinking skill of self-regulation can help us avoid some of these errors if we become more familiar with how they look in practice, let's examine several in closer detail.

“To paraphrase Socrates, the unexamined thought is not worth thinking.”

Pat Croskerry, MD.⁶

Heuristics: Their Benefits and Risks

Shakespeare called humans the paragon of animals. Aristotle said “rational animals.” For Plato, “featherless bipeds” was good enough. Perhaps not the most honorific descriptions, yet humbling and useful reminders that there are times when we base our judgments on unfounded assumptions and fallacious reasoning. The long list of argument fallacies in the table we put at the end of the Section 9 entitled “Warranted Inferences” does not include all the ways that our decision making can go astray. In the current section we consider a whole new set of biases and errors emerging from the *misapplication* of those ordinarily reliable reasoning maneuvers known as “heuristics.” Given the natural limitations of human rationality, it turns out that errors in heuristic thinking can result in serious problems when the risks are great and the stakes are high.

The correct application of cognitive heuristics is absolutely essential for day-to-day living. We would exhaust ourselves mentally and accomplish very little if every single judgment was a full-blown reflective decision. We get through the routine parts of our day making quick, automatic reactive heuristic judgments. We rely on these snap judgments because (a) most of the time they are good enough for the purpose at hand; (b) we need to conserve our mental energy for bigger, more important, and less familiar problems that life throws our way; and (c) often, we have no time for reflective thought. This will be clearer as you review the examples and do the exercises in conjunction with each of the following heuristics.

INDIVIDUAL COGNITIVE HEURISTICS

Cognitive heuristics are natural human decision-making shortcuts we all rely upon in real life to expedite our judgments about what to believe or what to do. There are potentially beneficial consequences associated with relying on the cognitive shortcuts we'll discuss. In each case we examine the heuristic shortcut or maneuver itself and note potential advantages and disadvantages of relying on the heuristic. A brief, true-to-life vignette and other examples illustrate how that heuristic looks in real life. In most cases a short exercise invites you to apply your critical thinking—and in particular your skill at reflective self-regulation—to occasions in your own life when reliance on that particular heuristic may have resulted in outcomes that were less successful than you had hoped. There are 17 common heuristics described in this section. Each is likely quite familiar.

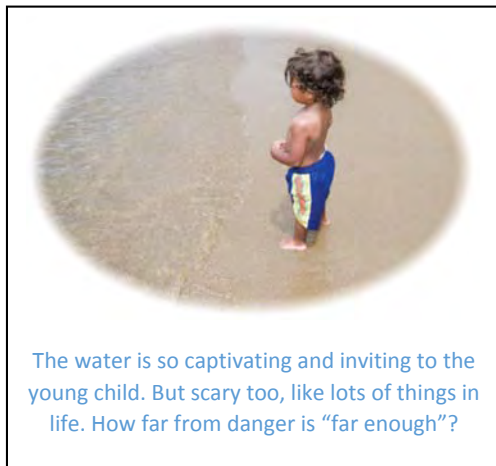
1. Satisficing and 2. Temporizing

The first time he was at the beach, young Jerome darted down to the wet sand and watched as a small wave washed up toward him. A wave came in and lapped at his toes and ankles, the chilly wet water sending him scurrying up the sand. He turned and cautiously approached the water a second time. Again he got close enough to just let the water touch the tips of his toes, and scooted up the sand. But not nearly as far as the first time. The third time he approached the surf he anticipated the wave as it approached and, instead of turning to run, he back-pedaled a few steps. Just far enough not to be hit by the salty bubbles. He went just far enough! The kid

satisfied, I thought, and, more interestingly, nobody taught him how.

The *Satisficing Heuristic*: Having found an option that is good enough, we take it. We human beings typically do only what must be done to achieve our purposes. In day-to-day living, when faced with choices, instead of expending the resources necessary to identify and then attain the maximally optimal alternative, we decide in favor of an alternative we deem satisfactory.⁷ How many times have we read the whole menu in a restaurant compared to reading along only until we spot an entrée that strikes our fancy? We tend to divide the world into “good enough” and “not good enough” and search for a solution until a solution is found that is good enough to attain the desired outcome. Truisms like “If it isn’t broken, don’t fix it,” and “Perfect is the enemy of good” reflect the satisficing cognitive maneuver.

- Example (System-1): Being thirsty, how much water would we drink? Only enough to slake our thirst.
- Example (System-2): Seeking a new job, how hard would we look? Hard enough to find one that meets whatever are our basic criteria for pay, proximity to home, nature of the work, etc.?
- Example (System-2): Having arrested a suspect who had the means, motive, and opportunity to commit the crime, how hard can we expect police detectives to strive to locate other suspects? Satisficing suggests hardly at all. The question of the actual guilt or innocence of the subject becomes the concern of the prosecuting attorney and the courts.



The *Temporizing Heuristic*: Deciding that a given option is “good enough for now,” or temporizing is satisficing’s running mate. We often move through life satisficing and temporizing. At times, we look back on our situations and wonder why it is that we have settled for far less than we might have. If we had only studied harder, worked out a little more, or taken better care of our relationships and ourselves, perhaps we would not be living as we are now. But at the time, each of the decisions along the way was “good enough for the time being.”

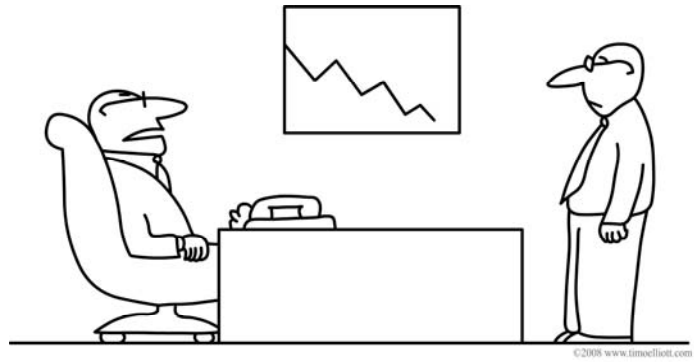
We must not overlook the important potential advantages to satisficing. These include conserving time, money, and energy.⁸ If you have to put in 10 percent more effort and time to gain only 1 percent more value, your return on that investment of effort may not be worth the cost. The main disadvantage of satisficing is that

we may be mistaken in our estimation of how much is “good enough.” Why did the better team lose the game? Because, in underestimating its opponent, the team failed to play up to its own potential. Why did we have trouble on the exam? Because we did not do the homework exercises and study hard enough. Why did my boss not give me a better evaluation compared to my peers? Because I was not productive enough, even though I had thought all along that I was doing just fine. Using our critical thinking in real time, we should take a moment in key situations to be sure our heuristic estimate of “good enough” is really accurate. To achieve greater success we will have to self-correct and recalibrate our sense of how much is enough.

3. Affect: “Go with Your Gut”

“I proposed on our first date. She said no. But somehow we both knew that her response was not going to be her final answer. A few months later we were engaged. More than 40 wedding anniversaries later, we are still in love. Perhaps we have been lucky; our marriage could have been a disaster. Whatever was reflective and rational about that decision—as I recall trying to explain it to her folks and mine—had to have been an effort to build a case for a decision we had already made.”

The *Affect Heuristic*: Making a decision based on your initial affective (“gut”) response.⁹ There is no question that many different kinds of experiences can cause us to respond with joy or sorrow, with desire or revulsion, with enthusiasm or dread. A “gut reaction,” that is, an affective response, is a strong System-1 impetus, either positively or negatively, toward the object.¹⁰ It is natural to have the response.¹¹ That response may be the “first word” on the matter, but System-2 self-regulation demands that we ask ourselves whether that should necessarily be the final word on the matter.



- Example: “Oh, I like those shoes. . . . You know, they would look great with the blue jacket I bought.”
- Example: “Did you see his eyes? Pure evil! Made my blood run cold. Believe me, a guy like that, no way should you trust him.”
- Example: “Forget it. I don’t want to hear about how you think we can balance the budget. You said the ‘T’ word and I won’t have anything to do with that. Read my lips, ‘No new taxes!’ We all pay too much in taxes as it is.”

Our natural, initial affective response to ideas, questions, images, people, events, etc., can have obvious advantages and disadvantages. Research on the relationship between facial and body symmetry, perceived attractiveness, and physical health suggests that first affective impressions we have about another human being as a possible mate are evolutionarily selected for and contributes to the survival of the species. Our System-1 affective reaction can influence us toward embracing a choice that “just feels right” or away from an option that appears frightening or repugnant when our System-2 decision making gets bogged down with too many factors to consider, too many divergent criteria, and too much uncertainty. Were it not for this, some of us might never get unstuck and make a decision when one is needed.

But, what if that initially frightening option is actually the best and most reasonable? For example, what if our fear of the anticipated consequences of radiation or chemotherapy influenced us to reject those options when one or both of them were the best possible cancer treatment options? It may take significant amounts of reflective System-2 reasoning to overcome a powerful System-1 affective response to an idea, but it can be done. And at times it should happen, because there is no guarantee that our affective responses are necessarily always true. Strong critical thinking demands that we check our affective responses. Simply having them is not nearly enough for wise, reflective decision making.

THINK CRITICALLY: Examples from Your Life

When “enough” was not good enough: Think of two recent occasions when you were disappointed by how your efforts turned out because of misestimating how much on your part was necessary to achieve your goals. Use your critical thinking skills to make a reasoned judgment regarding how to adjust your sense of “good enough” to increase your likelihood of success in the same endeavors the next time.

When your response was an emotional jolt: Think of two recent occasions when you had a strong initial affective response to an idea, proposal, opportunity, person, or event. Find one that was positive and one that was negative. Did you reflect on that response, evaluate it, and verify that it was the correct response? If not, this exercise provides the opportunity. Apply your System-2 reflective critical thinking skills to both of those responses. Gather needed information and analyze your response in the light of that new information. Call on your habits of truth-seeking and open-mindedness to support your effort to be as objective as possible in evaluating your initial responses.

The affect heuristic influences us to make judgments and decisions based on our initial impulsive and subliminal responses. Knowing this, marketing experts coined the expression, “The package is the product,” to indicate how important the wrapping, the container, and the initial appearance of a product are to making the sale.¹² Certainly a broken residence hall window and an unkempt campus lawn are not necessarily indicative of an academically substandard college. But college recruiters know that these things had better be fixed before prospective students show up for the campus tour. And on reflection, no one would argue that a cabernet in an attractively designed bottle with a classy label is necessarily superior to a cabernet in a generic bottle with a plain looking label.¹³ There is no question that first impressions count when choosing a college, choosing a wine, or choosing a mate.

4. Simulation

“I was in center field, my favorite position, and the runner at third was itching to tag up and dash for home if the batter hit a fly ball. I imagined what I would do if it were hit to me, how I would run in, position my body, make the catch and fire the ball to the plate on one hop so the catcher could handle the throw easily and tag out the runner. The odds were overwhelming that the batter would hit the ball someplace else. But no! The ball was in the air arcing over the infield and sailing out toward center. I darted to my right, took the fly out of the air with my gloved left hand and made my throw toward the plate. The runner had tagged, leaving early I think. But he didn’t have a chance. My throw, just up the third baseline from home, was on target and on time. The catcher put the tag on the runner for the third out. It was like I had made a movie in my mind, watched the movie, and then lived the scene almost exactly.”

The *Simulation Heuristic*: Estimating the likelihood of a given outcome based on how easy it is to imagine that outcome.¹⁴ Simulation is a mental process of imagining ourselves doing something successfully or unsuccessfully. Before giving a speech we might “see ourselves” at the podium talking to the audience with confidence, making our point, and delivering our message effectively. Or we may simulate the opposite, seeing



Marketing experts know that many of our purchasing decisions are based more on our affective response to the packaging than on our rational reflections on what is inside. Soap is just soap, that is, until it is packaged in either an attractive or repulsive way.

ourselves messing up, getting flustered, and forgetting to say things we had wanted to say. If we experience ease in processing a simulation, this influences us to believe that achieving the anticipated outcome is more likely.¹⁵ A person choosing among several options might simulate what it would be like to select an option and then, like making a movie in his or her mind, imagine what life would be like having selected that option. Unless we are being reflective about the actual probabilities that what we picture will actually happen, the simulation heuristic can influence us to select an option that plays out in our minds as the one offering the most desirable result. This might be called “wishful thinking,” but whatever it is called, it is not a reflective and well-informed

System-2 decision about the actual probability. The same would be true of pessimistically overestimating the likelihood of a bad outcome.

THINKING CRITICALLY: See Yourself ...

Simulate yourself hang gliding off the wind-swept cliffs along the Pacific Ocean. First, see yourself gliding up into the beautiful blue sky, enjoying the grand vistas and the glorious ocean, smelling the salty warmth of the sea air, swooping with silent grace toward the surf, and then lifting effortlessly and joyously on a vector of warm wind with the gulls and pelicans. Take your time. Enjoy the flight. Then when you are ready, ease yourself toward the soft sand and glide slowly to a perfect landing and the admiring approval of your friends. On a scale of 1 to 10, with 10 being “Yes, absolutely,” how much did playing that movie in your mind incline you toward wanting to try hang gliding? On a scale of 1 to 10, with 10 being “easy,” how easy would hang gliding be?

Now envision a second scenario. See yourself blown along, out of control, harnessed below a tissue-thick nylon wing attached to a flimsy aluminum frame, mentally on the edge of panic, your arms aching, and your back muscles knotted with tension. You are disoriented, high above the jagged rocks and treacherous waves, trying to dodge other hang gliders. Suddenly, you are distracted by the flock of gulls heading your way. You hear the shouts of people below, but are not able to understand what they are saying. You are uncertain about how to land this contraption without breaking both legs. On a scale of 1 to 10, with 10 being “Yes, absolutely,” how much did playing that movie in your mind incline you toward wanting to try hang gliding? On a scale of 1 to 10 with 10, being “easy,” how easy would hang gliding be?

Notice that neither simulation supplied any concrete information about hang gliding. Neither detailed the actual risks associated with the sport. Neither explained how one learns to hang glide, whether there are safer or more dangerous places to hang glide, or anything else that would have enabled one to make a reasoned and reflective System-2 analysis and evaluation in response to the question about how easy or difficult it would be.



- Example: “You know, I didn’t go there to buy a car. But when I was on the lot looking, this salesman came up to me and invited me to sit behind the wheel. Then we went on a test drive, and I could really see myself tooling along I-70 in this baby. So, here it is. My new set of wheels.”
- Example: “I don’t know what happened, sir!” said the sales representative to the manager after the failed presentation. “Yesterday I could see myself closing that deal.”
- Example: “Day trading. I took it up for a while. Lost a lot of money, too. You know it just seemed like it was going to be so easy. All I had to do was invest in some stocks in the morning and watch them increase in value as the day went along. Then sell them just before the market did its typical end-of-day little dip. Well.

Things didn't turn out that way at all. I think the only people who made money on my day trading were the guys who work at the brokerage house.”

Psychologist Albert Bandura's research on social learning demonstrates the value and power of simulation to increase attitudes of self-efficacy.¹⁶ Mentors and coaches use the simulation heuristic, (they may call it *visualization*) as a technique to improve performance and to help people anticipate being able to succeed at challenging things. Successful advertising often depends on stimulating simulation. Car ads, for example, often show someone with demographics just like the intended buyers taking great pleasure in driving the model of car the ad is promoting. The idea is that if you match those demographics, you would then be led to see yourself in that car and then want to buy it. The process of simulation is quick, easy, and need not be reflective. In fact, it might be better for the advertiser if you do not reflect too much on the actual costs and benefits of buying that new car. The obvious disadvantage of simulation is the potential to err in estimating the likelihood of the imagined outcomes. This can result in misplaced confidence and unwarranted optimism.

Everyone knows that simulating academic success is not a replacement for actually studying, doing the assignments, and doing well on exams. But along with those things, simulation can be very helpful. Take a moment and see yourself being a successful student by simulating how you will structure your time so that you can read the textbook and do all the exercises and assignments. Simulate how you will be organized, focused, and highly efficient in your use of that study time. See yourself going to class or taking tests justifiably confident in what you have learned, well prepared and ready to demonstrate your knowledge on exams and assignments. Oh, yes, and the critical thinking skill of self-regulation requires that we remind ourselves that we have to carry out the study plans that we have simulated, if we are to have a reasonable shot at achieving the learning and enjoying the success we anticipate.

5. Availability

“I was doing 75+ heading eastbound on I-96 from Michigan State back home to Detroit, alone, late at night. Darkness had engulfed the rural stretch of interstate. Occasionally, a car heading west passed by on the other side of the wide grassy median. Eastbound was two lanes, and I liked driving in the left lane because it was smoother since the heavy 18-wheelers had not furrowed and gnawed the pavement. But for reasons I'll never know, I decided that night to do the right thing, the thing I'd been taught in driver's education back in high school, and I moved back into the right-hand lane. Then, ahead, just over a slight rise in the interstate, I saw the glare of an approaching vehicle's high beam headlights. It didn't make sense—there shouldn't be any traffic heading west directly in front of me. I drove on, never reducing my speed. The lights grew brighter and brighter. I reached the crest of the rise in the freeway just as the other vehicle did. In a shocking blur it roared by, easily doing 75+. Heading west. On the eastbound side of I-96. And, thank God, he was in his right lane too. Moral of the story. Stay to the right, son, or you'll never know what hit you.”

The *Availability Heuristic*: Estimating the likelihood of future events based on a vivid memory of a past experience that leaps easily to mind. Let's experiment with a memory. Imagine a conversation you may have had about foods you can't stand. Does a particularly awful experience with that food leap to mind? For example: “I hate mushrooms. Once when I was a kid I got sick on mushrooms at a restaurant.” That quick, automatic connection is a manifestation of the availability heuristic. “No mushrooms on my pizza! Please.” This heuristic leads us to estimate the likelihood of a future event based on the vividness or ease of recalling a similar past event.¹⁷ Because a past experience leaps vividly to mind or because it was so important, we overestimate the probability that future outcomes will be the same as they were back then. People tell stories of things that happened to them or their friends all the time as a way of explaining their own decisions and warning or advising their friends and family about the future. Often these are helpful because they vicariously increase our own range of experiences. The use of stories makes it much easier for us to remember their lessons or morals. Aesop's fables have more than entertainment value; they remind us not to “cry wolf,” not to devalue what we have by coveting something we cannot get (as did the fox with the grapes), and many other solid bits of wisdom. On the

other hand, there is always the risk that in the retelling, the actual events may be mistakenly remembered, misunderstood, or misinterpreted. Whether accurate or not, stories have an unwarranted amount of influence on decisions about what to expect, what to believe, and what to do.



“That could be me! What would I do?
Where would I go?”

Availability sells. The news media, knowing the power of a compelling narrative, regularly “put a human face” on news reports. They know it is boring to hear newscasters drone on about statistics and abstractions—for example, about how many homes were damaged by a tornado or how many families lost electric power due to the storm. So instead, the news crew will interview an emotionally distraught person. They will take pictures or video of the person, the damaged home and felled trees in the background, looking lost among the scatterings of furniture and the family’s ruined and irreplaceable mementoes. This makes abstractions like “terrible tornado,” “brutal shooting,” “five alarm fire,” and “devastating flood,” vividly available to us. And because of the availability heuristic, we, unreflectively, jack up our estimate of the chances that we too might become a hapless storm victim—just like that sad person we’re seeing in the news report.

The disadvantage of basing judgments on the availability heuristic is that we will wrongly estimate the actual probabilities that a given outcome will occur.¹⁸ Or worse, while we are worrying about the far less likely possibility, we will stop paying attention to threats and problems that are far more likely to happen.

In the aftermath of the horrendous killings of over 30 people at Virginia Tech (VT) in 2007, parents, students, faculty, and staff at the nation’s more than 4,200 colleges and universities sharply revised their estimates of the probabilities of a similarly deranged killer’s assault on their own campuses. Campus security increased, counseling centers received more funding, legislators held hearings at the state and national levels, and campus authorities updated emergency plans and conducted readiness drills. Although these might have been good things to do, resources are finite. Were these the most urgent things for a campus to do, given all the other risks and threats out there? Probably not. Fire preparedness, weather disaster preparedness, theft detection and prevention, rape and assault protection, food poisoning prevention, and flu epidemic preparedness are just a few projects that address tragically lethal and somewhat more probable eventualities. But all the attention was on the VT situation. It was vividly in mind for administrators, students, parents, and the media. Those other more likely dangers were not on their minds right then. Hence, the disproportionate allocation of time, money, and attention.

6. Representation

“Uncle John did not smoke cigars at the track, he chewed them. Today he liked the filly—a sleek 3-year-old who looked fast. He would have to find her name in the racing form. But just watching her in the paddock, she reminded him of a horse he’d seen run so well at Bay Meadows a couple of years back. Same markings, same look of a winner in her dark, intense eyes. Hadn’t he won a couple of Benjamins at 8 to 1 on that filly? To Uncle John it only made sense to put down a bet on this one to win.” Uncle John made the snap judgment that because this horse looked like that other horse, this horse would perform like the other horse.

The *Representation Heuristic*: Making the snap judgment that X is like Y in every way upon noticing that X is like Y in some way. A perceived similarity becomes the basis for assuming that there is an analogical relationship between two things, an analogy that may or may not be warranted.¹⁹ For example, someone might

say, “My father and I were alike in so many ways—in our lifestyles and how we thought about things. Dad died a few years ago of lymphoma. He was only 69. You know, as much as I don’t like the idea, I probably have about 30 years before lymphoma gets me, too.” The speaker in this example is overestimating the probability of contracting a fatal lymphoma or even of dying at age 69. This thinking is disconnected from any System-2 analytical reflection on the scientific evidence regarding the genetic and environmental factors that estimate a person’s cancer risks. But absent that self-corrective reflection, we risk allowing the analogical representation heuristic to influence our beliefs and choices unduly.

If the similarity between two things is fundamental and relevant, it’s more likely that the analogy will be reliable. For example, suppose your co-worker was fired for missing sales targets. You might draw the reasonable conclusion that you are no different in relevant respects from your co-worker. Thus, if you miss your sales targets, you’ll be fired too. Good thinking.

Or the similarity might be superficial or not connected with the outcome, which would make the analogical inference much weaker. For example, we see a TV commercial showing trim, sexy young people enjoying fattening fast foods and infer that because we’re young, too, we can indulge our cravings for fast foods without gaining excess, unsightly poundage. This is another example showing that heuristic thought needs to be monitored when it is used to make important decisions. As we develop our critical thinking skill of self-regulation, we become more adept at noticing when our decisions hinge on the analogical representation heuristic. And we can correct ourselves before making a decision that is not well thought out. Self-monitoring and self-correcting one’s thinking can help ensure that conclusions are warranted. In a later section entitled “Comparative Reasoning” we will explore the criteria for the evaluation of analogical inferences in detail.



How about a little “truth in advertising” for a change?

7. Association

“We were having a good time, probably on our third beer, *Sports Center* was on TV someplace nearby, but we’re not really paying attention because Bill was talking about how the girl he was seeing really liked dogs, and he did, too. So, he’s saying that she has a pit bull. And I have no idea what Harry was thinking but he says, ‘How do you think Michael Vick will do this season? He was amazing his first year back in the NFL, but his third year in Philadelphia was a bust. So the Eagles dump him and the Jets pick him up?’ We all look at Harry because he’s on some other planet and say, ‘Where did that come from?’ And he’s like, ‘Pit bulls, dogs, dog fights, illegal, prison, Michael Vick.’ And then I’m like, ‘I wonder if Tiger Woods will pull off a comeback.’ And now they’re all looking at me. So I’m like, ‘Hey, you know! Michael Vick, troubled athlete, big comeback after major issues. Can Tiger do the same? Which reminds me, are we all still on for golf this weekend?’”

The *Association Heuristic*: Connecting ideas on the basis of word association and the memories, meanings, or impressions they trigger. We all have experienced conversations in which one comment seems connected to another by nothing more than word association. Someone might suggest, “Let’s take our drinks outside to the picnic table.” To which someone else might respond, “Remember the picnic three years ago when Grandpa had his heart attack? I’m never going to that park again.” The representativeness, or

associational heuristic maneuver, is triggered when a word or idea reminds us of something else. Typically, this is System-1 thinking: reactive, associational, and not critically reflective. For example, one person might associate sunshine with happiness, and another person might associate sunshine with sweaty work picking strawberries. Or, as in the example above, “picnic” with Grandpa’s heart attack. The salient negative experience brought to mind by the mere use of the word *picnic* influenced the speaker to assert the decision never to return to the park where the sad event occurred. This unreflective decision emerged from the System-1 reaction triggered by the word association in this person’s mind.

From “pit bull” to “eagle”? System-1, loosened from sound critical thinking, takes full flight with the association heuristic.



Associational thinking, an unmonitored nearly stream-of-consciousness mind flushing twitter-blab of ideas, is of very little value, logically speaking. But if the associational thinker is also saying out loud everything that comes to mind, it can be creative, frustrating, and entertaining all at the same time. And way too personal! It is rather commonplace in today’s culture, and yet we seem unconcerned that judgments made using associational thinking can be very flawed. Instead the media report the results of causal twitter fests and “instant polls” as though these represented our best and most informed thinking on a given topic.

THINKING CRITICALLY: Last Word to First Word

Listen attentively to a conversation. But do not focus on the topic being discussed, instead focus on the words as they are said. Pay special attention to the last word or expression in a sentence and count how many times the next speaker uses that word or expression as the first thing they say. An associational thinker—and we use the term *thinker* advisedly—often interacts conversationally by connecting what he or she says to the last word in the sentence that the previous speaker uttered. No, this doesn’t make any logical sense. But listen for it nonetheless. Keep a log of which person in the conversation does it the most frequently. And keep track of whether or not the topic of the conversation is actually altered from whatever it was before to whatever topic the associational thinker introduces. Put a clock on the topic. See if any topics at all can last more than three minutes when the associational thinker is in full form.

8. Stereotyping

“I met this Marine, a young corporal, and he was an impressive young man. I could tell just talking to this young soldier that our servicemen and servicewomen are wonderful people.” Stereotypes are generalized perceptions that members of one group of people have regarding another group. They shape how we see others and how others see us. The System-1 tendency is to think that everyone in the group has the characteristics, positive or negative, associated with the stereotype. Societal stereotypes tend to evolve slowly.²⁰

The *Stereotyping Heuristic*: Making a snap judgment about an entire group based on a single instance. Although an anecdote is not data, we have all heard people draw conclusions about whole groups of people based on their experience with only one or two people who are members of that group. We call this stereotyping or profiling. There are advantages to stereotyping, because it is a highly efficient way of thinking. For example, we tend to stereotype grandparents as loving caretakers. So if I say that I am having Grandma watch my daughter, you are not likely to worry too much about the child. On the other hand, there are risks associated with stereotyping. Profiling groups of people based on unfortunate experiences with one or more of its members can lead to bigotry, prejudice, misunderstanding, and mistrust, to name only a few.

Humans do not have the time to make systematic scientific surveys of everything we may need to know. So,

we take the shortcut of basing decisions on relatively few instances. This is what we are doing when we ask a friend if she or he knows a good dentist, doctor, real estate broker, or lawyer. Or if we ask an alumna to tell us how good her college experience was when we are trying to decide where to go to school. The trade-off between effort expended and the reliability of the information derived makes this approach risky. Yes, it's a starting point to get some preliminary information, but it is not an ending point of a thorough investigation. Here again, monitoring one's habits of mind is a good idea.



The tendency to think that our personal experience of a single instance is predictive of what we would find were we to sample more systematically a whole class of individuals can undermine decision making in almost any context. We eat a burger at a fast food restaurant and make a snap judgment about everything on the menu there and at every other restaurant in the same chain. Does this work for paintings by a given artist, songs by a given songwriter, and novels by a given author? What about courses taught by a given professor, patient problems treated by a given health care provider, or building proposals by a real estate developer?

One example of negative stereotyping in contemporary America is the idea that all Muslims are terrorists.²¹ Like other negative stereotypes based on race, ethnicity, religion, or nationality, this one fuels fear and hatred. In our more reflective moments we realize that Muslim Americans were victims in the 9/11 attacks on the Twin Towers along with Jewish Americans, Christian Americans, and Americans who practiced no religion. We know that Muslim Americans serve with distinction in our armed forces, including side by side with soldiers of other faiths in combat in Afghanistan and Iraq. And we know that millions of American Muslims go to work every day, take care of their families, pay their taxes, and contribute in numerous ways to the quality of our communities. The same is true of millions of African Americans, Jewish Americans, Mexican Americans, Native Americans, Mormon Americans, Catholic Americans, Chinese Americans, etc. But our System-2 reflective considerations about freedom of religion and the rights of others can evaporate if System-1 kicks into overdrive. Negative stereotyping can trigger just that kind of kneejerk defensive hostility. And when that happens, occasionally System-2 is dragged into the skirmish, because all of us are naturally inclined to seek rationalizations in support of our unreflective reactions.

Sensationalist media and unscrupulous politicians relish playing on our weakness for stereotypes. Stereotyping, particularly vicious negative stereotyping, sells papers and garners votes. And, say the unethical journalists and politicians, “Who cares who you have to hurt as long as you make money and win election, right?”

We know that it is difficult to root out the System-1 reactive stereotypic responses. On occasion it takes encountering a remarkable person or story to help us realize that our kneejerk stereotypes about people can get in the way of good judgment. Recently, for example, a 6-year-old little girl was rescued from a kidnapper by a brave man and his wife. Seeing the kidnapper snatch the child, they took immediate action. He chased the kidnapper while she called the police. The man who pulled the child out of the grasp of the kidnapper was

honored by the mayor as a hero. The national news picked up the story. Oh, and, as it turns out, he is an illegal immigrant.²²



Stereotype breaker, Kent Dolasky

Speaking about jarring counterexamples that challenge strong critical thinkers to examine their unreflective stereotypes about people, do you know who Ayaan Hirsi Ali is? Yes, exactly, she is the former member of the Dutch Parliament, native of Somalia, ex-Muslim, feminist who advocates Islamic-Christian dialogue in America.²³ Or do you know Sgt. Maj. Kent Dolasky, retired commandant of the US Joint Special Operations Forces Senior Enlisted Academy with



Stereotype breaker
Ayaan Hirsi Ali

multiple combat tours? Right, he's the army veteran who teaches business at the community college level and founded the Buckets of Hope volunteer organization to assist the homeless in Tampa.²⁴ And, above all, strong critical thinkers know that none of us are obliged to live out the stereotype that anyone is trying to force upon us.

9. “Us vs. Them”

“I went to Congress to lobby for the reauthorization of the Higher Education Act and to support increased funding for Pell Grants and other forms of student aid. I explained that higher education is a benefit to the person who is fortunate enough to afford to go to college. Research shows consistently higher earnings for college graduates than for those who have not gone to college. But, I said, college education provides benefits to society as a whole. The teachers, nurses, businesspeople, engineers, journalists, social workers, and the like, who attained access to those professions through their college education, provide much needed services for everyone in the community. I was told by one member that he simply did not agree with that. His reason was simple: ‘I’ve heard all that before because it’s what the other side says.’ I asked the member to help me understand his thinking better and he replied, ‘You see, on the Hill, it’s good guys vs. bad guys. They’re the bad guys. Whatever they say, whatever they want, whatever argument they make, I don’t buy it’.”

The “Us vs. Them” Heuristic: Reducing decisions to the choice between two starkly opposing options and then rejecting whatever option your opposition favors. This could be named the “good guys vs. bad guys” heuristic as well because applying this heuristic results in an automatic competitive and oppositional relationship. And our tendency, evolving from the earliest survival instincts of our species, is to band together with “our own people” to fight “those other guys.” Battle lines are drawn with phrases like “Those who are not with me are against me”; “There can be no middle ground”; “Never compromise”; and “There can be no negotiations.”²⁵ Once our minds apply the Us vs. Them heuristic to a situation, many other decisions about the people or issues involved become very simple. We have no obligations toward “them” or toward anything they want or anything they represent. But, if you are one of “us” we will stand by you through thick and thin.²⁶ In its most extreme manifestations, the Us vs. Them heuristic can set up the tendency to regard “them” as non-persons,



Steve Jobs and the Us vs. Them Heuristic

objects off the ethical radar screen, “others” who can be manipulated or removed without ethical concern. As a nation, we saw this in the torture and prisoner abuses at Abu Ghraib. Called the false polarization effect,²⁷ this tendency to divide the world into two opposing camps can be a very dangerous approach to problem solving and a potentially explosive and negative strategy for a society or a leader to take.



A Student Body president champions a new resolution. How does the power differential within student organizations affect the work of the group and the sense of group unity?

Let us not be naïve about this. If humans are strongly influenced by Us vs. Them thinking, then it would be foolish of us not to take that into consideration when approaching others for the first time. Generosity of spirit and openness are wonderful virtues, but venturing into potentially hostile territory with caution thrown to the wind is seldom likely to be the optimal choice. An advantage of this heuristic is that it orients our thoughts and actions in support of our family, our team, our platoon, our business, our community, “our kind.” And, obviously, the disadvantage is that we lose objectivity and impartiality, and we can be prone toward bias and prejudice if we are not reflective. In instances like these, our critical thinking (System-2) must override the pull toward prejudice arising from the misapplication of the Us vs. Them heuristic.

High school might be described as the Kingdom of “Us vs. Them.” In the black-and-white thinking that characterizes adolescent cognitive development, the tribal divisions, loyalties, rituals, and rivalries of the Us vs. Them mindset flourish. For example, search and watch the “Pep Talk” scene from *Glory Road*. The coach begins by antagonizing his players with racial stereotyping, and their gut response

(affect heuristic) is silent anger and resentment. The coach says that they cannot win the national championship, because they cannot think. He describes them losing the game, they can see it happening (simulation) in their minds, and they become even more agitated because he is the authority figure and he is saying they will lose. They do not want to lose. This is not “just a game.” Then the coach changes his tone and evokes the Us vs. Them heuristic to rally the players and unify the team. The short scene ends with one of the players making the point to his teammate that he needs to play good defense (not satisfice), because the usual effort will not be good enough. There are some great “Us vs. Them” moments, simulations, and System-1 affect heuristic appeals to be discovered if you search for the best movie pep talks of all time.

Journalists, politicians, zealots, coaches, and evangelists of all stripes use our natural tendency to mistrust “those other people”—the ones who are not part of “us,” the ones who are different, the ones with whom we disagree. Unscrupulous people make an enemy of the opposition and ascribe to them evil and dangerous intentions. This rallies the troops against the external threat and makes it unnecessary to take seriously what “they” have to say. In the cut-throat competition for high office, campaigners strive to marginalize or even demonize their opposition, engender fear in “us,” lest “they” should “get what they want,” “come to power,” or “take what is rightfully ours.” The risks associated with dualistic thinking are serious, and these risks are compounded when fear and mistrust are set in opposition to loyalty and group identity.

The Us vs. Them Heuristic is a favorite tool of zealots, extremists, hate-mongers, and bigots. Why does it work for them? Too often because, fearing their wrath, the rest of us fail to muster the courage to challenge their caustic and divisive rhetoric with accurate information and sound reasoning. The positive critical thinking

habit of truth-seeking requires the courage to ask tough questions and to follow reasons and evidence wherever they lead. History shows us how devastating and explosive religion in the blind service of nationalism can be. That has not changed. So it is not an exaggeration to say that the lives of tens of millions of people may depend on the courage and capacity of educated and truth-seeking men and women to stand up to those whose ambitions or beliefs demand the economic, political, or military annihilation of all of “them”.

THINKING CRITICALLY: Is the Infotainment Media Helping or Not?

“If you're not careful, the newspapers will have you hating the people who are being oppressed, and loving the people who are doing the oppressing.”

Malcolm X

What role does the infotainment media play in promoting or exposing unfair stereotyping and “Us vs. Them” thinking? Consider stereotypes based age, job status, religion, ethnicity, sexual orientation, educational level, and nationality. Use evidence, not just personal experience, to come to a fair and accurate evaluation of the role of the media. For example, search “Islamophobia” and read articles on the changes in attitudes toward Muslims over the past 20 years. One perspective is offered by Professor Hatem Bazian in his short piece, “Latent and manifest Islamophobia.” Do the same for “poor people” and for “CEOs.” If you discover that the media have been fanning the flames of fear, rather than promoting harmony and acceptance, see if you can find another social group that the media has treated in the opposite way.

At this time in our national history the electorate is almost evenly divided between the two major parties. This is why voting is such an important responsibility. In statewide and national elections, political control turns on changing the minds of small percentages of people. A shift of 5% one way or the other can empower one party or the other to have control of the U.S. Senate, or to win the governorship of a state. Explore how shifting just a few Senate seats can impact control of that house of Congress. Passing or defeating a statewide referendum or electing a President can depend on shifting just a few percent of the likely voters this way or that. Political parties use wedge issues, like gay marriage, immigration, and marijuana legalization, play on our System-1 heuristic thinking. Can our collective System-2 critical thinking overcome the divisiveness with reasoned judgment?

10. Power Differential

“I once worked on a senior management team that was headed by a CEO who was the personification of the ‘alpha male.’ I recall one meeting where the other nine vice presidents and I were sitting along both sides of a conference table, with the CEO at the head of the table. He wanted us to discuss a proposal he had come up with the night before. He presented his idea by handing out five pages single-spaced and talking non-stop for half an hour. Then he said, ‘OK, now I’d like to hear from you.’ Nobody spoke. Nobody believed he actually wanted to hear our views. Nobody wanted to rock the boat or risk crossing him by pointing out even the smallest flaw or raising even the most tentative counterargument. The CEO waited less than two seconds. When nobody responded, he said, ‘OK, then. That’s it. We’ll implement this. Now, next topic.’”

The *Power Differential Heuristic*: Accepting without question a belief as stated by, a problem as presented by, or a solution as proposed by, a superior authority. Social hierarchies abound at home, at work, in government, in religion, and even in recreation. Many are benevolent and respectful. But even in these cases, and certainly in those that are manipulative and abusive, there is a tendency to defer to the individual (or subgroup) in charge. It may be something as benign as agreeing on when to eat dinner or which TV show to watch. The decision to

defer—that is, not to dispute or challenge—the decisions of others higher in the social pecking order is natural. It manifests itself in our accepting what “those above us” may decide to have us do. This heuristic leads us to see the world as how our leaders see it and to understand problems and issues the way our leaders describe them to us. Middle managers in a corporate culture are susceptible to similar pressures from senior executives, as are second children from their elder sibling, or junior officers relative to their superiors. But “pressure” is not exactly the correct word, for this heuristic makes compliance with authority the automatic reaction. Thus, when one is out of step with one’s “higher-ups,” one often feels more discomfort than when one is “going along to get along.” In a gang, for example, the power differential between the gang leader and his or her followers, when combined with the Us vs. Them heuristic for viewing the world, can strongly influence gang members to internalize gang rivalries and to agree with violent responses to perceived threats.

There are some advantages to recognizing the realities of power differentials and not bucking the system. Not only can this save cognitive resources, it might save your job and your domestic happiness as well. After all, if the boss wants the client list updated, why not update it? And if your partner wants to go to a movie that might not have been your first choice, why not go anyway? Having people see things your way may not be the highest of all values, even if you are smarter than they are about some things. Societal harmony and domestic tranquility are values, too.

On the other hand, how many times have we seen clearly that the boss was heading the department in the wrong direction, that the team captain was employing an ineffective strategy, that our elder sibling was wrong, or that our leaders were motivated more by self-interest than by the common good? Any full evaluation of the reasoning presented by those in power over us—coaches, teachers, ministers, managers, governmental authorities, or otherwise—should include consideration of whether the benefits derived from the current power structure relationship warrant continuing that relationship or whether it is time to consider seriously other options. In reviewing one’s options, do not forget the influence that the satisficing heuristic, discussed earlier, can have on our sense that, however flawed our current situation may be, it is “good enough.”

11. Anchoring with Adjustment

“The first book report I wrote as a ninth grader was about the novel *Space Cadets*. My report earned a C-. The teacher, a lover of eighteenth- and nineteenth-century British literature, found scant merit in the silly juvenile novel I had chosen and even less merit in my futile attempt to state its theme and explore how its author had developed plot and characters. A friend of mine received an A on his report on George Elliot’s (Mary Ann Evans’) 1861 novel, *Silas Marner*. About halfway through the academic year I was consistently making C-, C, or C+ on my work, and my friend was doing A- or A work. So, we switched. I started writing reports using his name and he wrote reports using my name. My grades (that is, the grades he earned for me) edged up into the C+ and B-range. His grades (that is, the grades my reports earned for him) held steady except for one B+ late in April. Our analysis: In the mind of our teacher from the first paper we submitted in September and throughout that whole year, I was a C student and my friend was an A student.”

The *Anchoring with Adjustment Heuristic*: Having made an evaluation, adjust only as much as is absolutely necessary and then only if new evidence is presented.²⁸ When we are making evaluative judgments, it is natural to locate or anchor our evaluation at some point along whatever scale we are using. If we are being more reflective, we may have established some criteria and we may be working to apply them as fair-mindedly as possible. As other information comes our way, we may adjust our evaluation. The interesting thing about this cognitive maneuver is that we do not normally start over with a fresh evaluation. We have dropped anchor and we may drag it upward or downward a bit, but we do not pull it off the bottom of the sea to relocate our evaluation. First impressions, as the saying goes, cannot easily be undone.

One advantage of this heuristic is that it permits us to move on. We have done the evaluation; there are

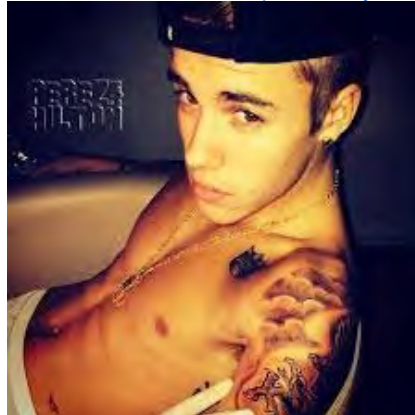
other things in life that need attention. We could not long endure if we were to constantly reevaluate everything anew. Part of developing expertise is learning to calibrate and nuance one's judgments, refine one's criteria, and adjust the criteria to fit the complexities of the circumstances of judgment. Anchoring with adjustment can reflect a progression toward greater precision, a way to refine not only judgments about particular things, but the criteria applied when making those judgments.

The unfortunate thing about this heuristic, however, is that we sometimes drop anchor in the wrong place; we have a hard time giving people a second chance at making a good first impression. How often have we seen it happen that a co-worker's performance is initially evaluated as sub-par (outstanding) and almost nothing that happens subsequently can move that initial evaluation marker very far from where it started? Subsequent outstanding work (poor work) is regarded as a fluke or an anomaly, not as genuine counterevidence that should result in a thorough reevaluation.

THINKING CRITICALLY: Anchoring on First Impressions

Your personal reputation, positive or negative, can be one of the most difficult anchors to raise. If you have had the misfortune of making a poor first impression at some point in your life, you may know firsthand just how difficult it can be to overcome that unfortunate beginning. But this exercise is about the impressions you have of others. Reflect on the people whom you have met over the past year or two. Think of some whom you initially thought highly of and others whom you did not like at first. Has your general impression of any of these people changed? If yes, describe what the person did or said that was so memorable that you hauled up your anchor from positive waters and dropped it in negative waters, or vice versa. Now reflect on the others, and ask yourself what it would take for you to radically revise your initial opinion of any of them.

What about celebrities? Our opinions of celebrities often anchor on our first impressions and then adjust very slowly, unless the celebrity does something really "out of character." Think about Robert Downey, Jr., drug addict and criminal? Or Robert Downey, Jr., Oscar-nominated movie star? Sherlock Holmes! Or think about Tiger Woods, all-world golfer or Tiger Woods unfaithful husband. Then there is Justin Bieber, a personality still under construction.



12. Illusion of Control

"They hired me because I was known as a corporate gunslinger. I know how to take a failing organization and turn it around in short order. I kick ass and take names. I hire people who want to bust their butts to get the job done, and I fire the deadwood and anyone who gets in the way of what we're trying to do. Within 90 days I had reorganized the finance division and the technology division. Sales needed major work. That took another three weeks, but I put in the right people and revised our marketing approach. Then it was time to increase productivity and decrease costs in our manufacturing operation. In six months I had stopped the bleeding. In nine, we had bottomed out and were starting to see the signs of a turnaround. We posted our first net profits at the end of my fourth quarter with the corporation. I stayed another two years and then the

job got so boring that I had to move on. So, now I'm on the market looking for another company that needs my skill set to save its cookies.” The gunslinger's constant references “I did this” and “I did that” gives no credit to the team effort it really takes to turn an organization around. Perhaps the gunslinger deserves praise and credit for his or her leadership contributions. But from my own personal experience, I assure you that turning around a large organization that is in real trouble is a group project, not a one-person show. The gunslinger in this example is looking back on the project with an exaggerated and illusory sense of his or her own personal control over how events turned out.

The *Illusion of Control Heuristic*: Estimating the control you have over events by the amount of energy and desire you put into trying to shape those events. When used correctly, this heuristic helps calibrate estimates of our effectiveness and thus helps us gauge how hard we should try. When misapplied, the illusion of control heuristic leads us into snap judgments that are nothing more than wishful thinking. We frequently overestimate our actual ability to control the outcomes of events because we consistently fail to account for contingencies.²⁹ We overestimate our control of a situation because we underestimate the influences of other people and events. As a result, we imagine wrongly that there is a very strong relationship between whatever we might do and how things are going to ultimately turn out. Wanting a given outcome strongly, we tend to think that decisions we make or actions we take are genuinely instrumental in bringing about or failing to bring about that outcome regardless of the actual contingencies, forces, and factors at work.

THINKING CRITICALLY: In Control of Your ATV

Yamaha makes one of today's most popular ATVs, the Yamaha Rhino. Before going further in this exercise, answer this: Suppose you were given, free of charge, the offer to use as you wish a Yamaha Rhino all day and you had complete access to a beautiful recreational area with hills, streams, ravines, woodlands, and open meadows. Assume that you would not be charged any money, even if you brought the vehicle back damaged. On a scale of 1 to 100, with 100 being “Absolutely, yes!” how likely would you be to accept this offer? After marking down your answer, search and watch the multiple news stories about ATV dangers. (Search “ATV dangers.”) Listen to the riders who are interviewed. Do any of them exhibit indications that they may be suffering the influences of the illusion of control heuristic? Explain why. Now, having seen the video, on the same scale of 1 to 100, how likely would you be to accept the offer of the free use of the Rhino? If you changed your answer from the first time, that is OK. Question: If you changed your answer, why did you change? Reflect on your second decision. Did any of these heuristics play a role: availability, simulation, representation, anchoring with adjustment? Did your sense of risk and possible loss increase or decrease having seen the news story?



13. Optimistic Bias and 14. Hindsight Bias

Please answer these three questions: Are you any more or less likely than others just like you to contract cancer at your age? Are you more or less likely than others just like you to suffer a debilitating injury in a traffic accident? Are you below average or above average in your ability to get along with others?³⁰

The *Optimistic Bias Heuristic*: Tendency to underestimate our own risks and overestimate our own control in dangerous situations.³¹ On the two questions above, approximately 75 percent of us will estimate our risks to be lower and about 25 percent will say higher. But, the true answer is that our risks are neither higher nor lower than persons just like us. This natural tendency toward optimistic bias has the evolutionary advantage for our species of providing us with the courage to move ahead in life. The constant dread of serious hazards could be mentally detrimental and debilitating. However, since our risk of hazard is actually no better and no worse than others', all things being equal, this built-in bias results in poorer and perhaps riskier judgments in some situations. Our sense that we will succeed where others have failed, or that we are not as likely as others to suffer misfortune or the ill effects of bad decisions can lead us to take unnecessary risks.



How does our high level of confidence in our ability to control events and our optimistic sense of youthful invincibility impact our decisions regarding health insurance?

Please answer these questions: Have you ever felt that you did not receive your fair share of the credit for your contribution to a highly successful project? Were you ever unfairly blamed when things went wrong, even though the unfortunate outcomes were beyond your control?

The *Hindsight Bias Heuristic*: Tendency to remember successful events as being the result of the decisions we made and actions that we took and past failures as having resulted from bad luck or someone else's mistakes.³² Our human need for accuracy, predictability, and self-justification is believed to motivate this hindsight-biasing behavior.³³ Hindsight bias adds fuel to the fire of our false confidence, for it inclines us to believe that our decisions and actions had a strong positive impact on the outcome of events, or, if things did not turn out as hoped, the fault was not ours. The tendency to take undeserved credit for good outcomes or to shift responsibility to others for undesirable outcomes is something we humans seem to have in common.

We do not mean to suggest that we are mistaken every time we feel unfairly blamed nor that we are mistaken every time we feel in control of a situation. By noting these potentials for wrong judgments, however, we are able to anticipate the possibility of a mistake and correct our thinking before we dig in too deeply to the feelings of pride or resentment that come with being mistakenly praised or blamed. We can use our self-regulation critical thinking skills to monitor ourselves for optimistic bias and hindsight bias so that our estimations about how much we really can control or how much blame or credit we deserve are made more reflectively, and hopefully, more accurately.

15. Elimination by Aspect: “One Strike and You’re Out”

“I went on four job interviews, which was great because many of my friends were having trouble getting any interviews. The interviewers all wanted me to make a PowerPoint presentation. And, of course, there was a lot of meeting individuals and groups of people. And the mandatory lunch when you have to remember to order lemonade instead of anything alcoholic. All those parts went fine. But at one place there was this guy who kept interrupting my PowerPoint to ask questions. I don’t want to work there, not with jerks like him in my work group. This other place was OK, great new computers in fact, but the cubicles were gray and so was the carpet. I just didn’t like how blah it looked—too institutional, you know. So, really, it’s down to the other two places, and I’m hoping to get an offer from one or both of them real soon.”

The *Elimination by Aspect Heuristic*: Eliminating an option from consideration upon the discovery of one undesirable feature. There are simply too many choices! The Excalibur Hotel in Las Vegas boasts a 500-dish smorgasbord. DIRECTV and Comcast offer hundreds of channels. Want to buy a car, rent a downtown condo, enroll in an MBA program, or select a can of soup



Do you think retailers know that too many choices can overwhelm System-2, causing us to fall back to our reactive heuristic-driven System-1 responses? If so, isn't that exactly what they want—that we should just buy without thinking through our decisions?

from the grocery shelf? There are thousands from which to pick. How do we move efficiently through this maze of opportunities? Certainly not by giving our full attention and due consideration to every aspect of every option. Rather, we hack through the choices individually or in whole bunches at a time, pushing the clutter out of our cognitive path as quickly and efficiently as possible. Elimination by aspect is our heuristic strategy. As soon as we identify a “reason why not,” we dump that option and options like it. The reason does not have to be monumental. I don't like brown cars or used cars. That's it. For me, the car-buying choices have just been reduced by tens of thousands. Don't like cream sauces? Great, that cuts the smorgasbord problem down by a huge percentage. Don't like to wait behind other folks grazing through the food line? Fine, step around them to an open spot along the smorgasbord and never worry about looking back at the dozens of culinary delights you may have skipped.

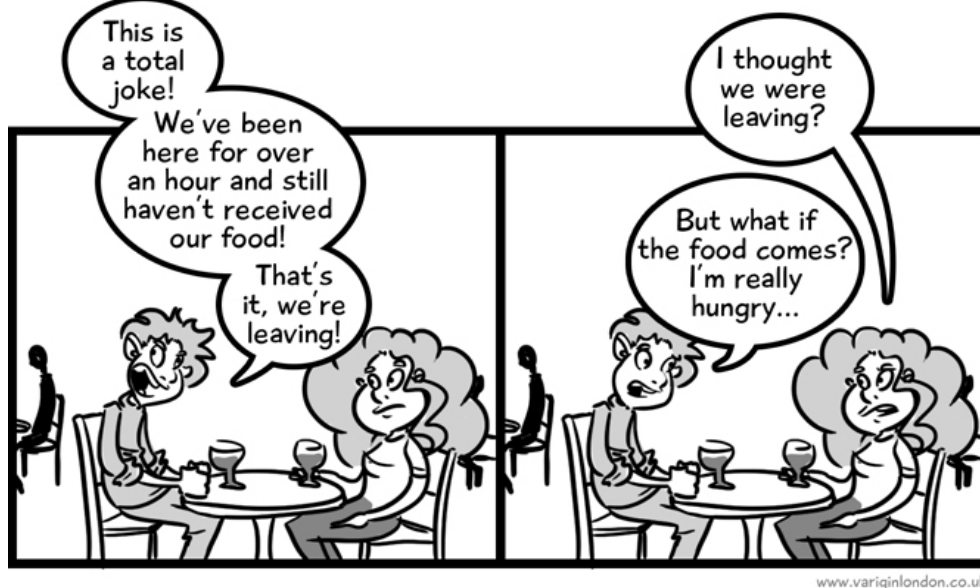
In situations where we enjoy a plethora of acceptable choices, the cognitive utility of elimination by aspect cannot be overestimated. However, the price we pay for conserving all that energy and time is clear, too. Applying this heuristic may result in a final selection that does not reflect the best holistic choice we might have made. The used car I refused to consider may have been just as good in every way as a new car of the same make and model, but thousands of dollars less expensive. I will never give that car its due consideration, having eliminated it entirely from view when I rejected it along with all others that were labeled “used.” In situations where our choices are limited and where no option is perfect, this heuristic can be a major liability. Because nobody is perfect, balancing the good with the bad is a sign of wisdom. The one strike and you're out approach denies this reality. Political litmus tests, for example, could paralyze a pluralistic democracy. We would all soon become hermits if we tried to select our employees, friends, and leaders on the principle that any one flaw is a fatal flaw.

16. Loss and Risk Aversion

“Early in my career I was offered an entry-level management position with a new company in a new industry. The company was called Cingular Wireless. I didn't seek the job. And I was a bit surprised when the offer was extended one evening during a dinner party. It would have meant a lot more money than I was earning as a part-time instructor. A job like that would have been the ticket to a lucrative corporate career. But I had a job in the field of higher education, and, with a couple years of experience, I was becoming comfortable in the role of college teacher. I didn't want to lose the identity I had just begun to create for myself. I wasn't sure what it would be like to work in the corporate sector, having all my life been either a student or a teacher, and recently a new mother. My daughter was less than a year old at that time. What if the job with Cingular didn't work out? Somehow the idea of remaking myself into a corporate junior executive seemed too risky and there was too much to lose. So, I thanked the person but declined her offer.”

The *Loss and Risk Aversion Heuristic*: Avoiding risk and avoiding loss by maintaining the status quo. Not losing anything, not going backward, at least staying where we are, for most humans, is the preferred default outcome, particularly under conditions of uncertainty. Research demonstrates that most humans are more likely to pass up

an opportunity to make a gain rather than risk a loss.³⁴ Humans psychologically privilege the status quo. Whenever possible, humans take an incremental approach, seeking to avoid uncertainty and the difficult cognitive tasks of weighing and combining information or trading-off conflicting values, rather than opting for more dramatic change. Muddling through personal decisions, attempting to avoid any loss, is the norm rather than the exception. We’ve all heard the old adage “A bird in the hand is worth two in the bush.”



Making decisions on the basis of what we do not want to risk losing can have advantages in many circumstances. People do not want to lose control, they do not want to lose their freedom, and they do not want to lose their lives, their families, their jobs, or their possessions. And so, in real life, we take precautions. Why take unnecessary risks? The odds may not be stacked against us, but the consequences of losing at times are so great that we would prefer to forgo the possibilities of gain to not lose what we have. Can you think of an example of this in your life?

We are more apt to endure the status quo, even as it slowly deteriorates, than we are to engage in change that we perceive as “radical” or “dangerous.” Loss and risk aversion have the disadvantages of leading to paralysis or delay precisely when action should be taken. Having missed that opportunity to avert a crisis, we discover later that it requires a far greater upheaval to make the necessary transformations once the crisis is upon us. Worse, on occasion, the situation has deteriorated beyond the point of no return. In those situations we find ourselves wondering why we waited so long before doing something about the problem back when it might have been possible to salvage the situation. History has shown time and time again that businesses that avoid risks often are unable to compete successfully against those willing to move more boldly into new markets or into new product lines.

Uncertainty, risk, and fear of loss are the tools of those who oppose change, just as optimistic bias and simulation are the tools of the proponents of change. There were and continue to be abundant examples of both in the protracted and highly politicized debate over Obamacare. And, of course, both sides use satisficing, temporizing, affect, availability, representation, stereotyping, and “Us vs. Them.” The Writing Space for this section invites you to identify examples, explain and evaluate the reasoning behind the use and abuse of cognitive heuristics by both sides in the political push and pull of US health care reform.

THINKING CRITICALLY: Why Privilege the Status Quo?

Reflect on a recent experience in your life that involved making a decision that included some element of risk and potential loss. In a purely objective analysis the *status quo* is only one possibility among many and should not be given any more value than any other state of affairs. But, as you saw in the “Loss and Risk Aversion” discussion, for human beings, built as we are with an aversion to loss and risk seemingly in our DNA, that is easier said than done. How did you handle the decision you faced? Were you able to give the status quo no more or no less value than any other possible state of affairs? How might a stronger application of the critical thinking skill of self-regulation have affected the decision? In other words, what steps can you take to monitor your own decision making for loss aversion? Write out some questions a person might ask himself or herself that would help the person make a good decision in contexts of risk, uncertainty, and potential loss.

17. “All or Nothing”

“I heard that there were going to be budget cuts and layoffs. We all knew that the economy was in the tank. But this is a big university with an annual operating budget over \$230,000,000 and more than 1,800 faculty and staff members. So, I figured that the chances that they would cut the course that I was going to take next semester out of the budget had to be about 100,000 to 1. I mean, they probably offer thousands of courses here every year. And there are so many other places to save money at a university without cutting academics. So, I planned my work hours and day care around taking that course. And then I go to register and it's not in the schedule. I learned they dropped it for budget reasons. Can you imagine! How am I supposed to complete my program if they cut required courses like that one?”

The “*All or Nothing*” Heuristic: Simplifying decisions by treating remote probabilities as if they were not even possibilities. By and large, when making decisions, we do not calculate Bayesian probabilities. Computers might, but humans do not. But over the millennia as a species, we humans have done reasonably well for ourselves (so far) by operating as if the exact probabilities did not really matter. Instead of thinking that there is precisely a 92 percent chance of this occurring or a 12 percent chance of that occurring, we tend to simplify our estimations and move them toward the extremes. In fact, we behave as if the odds were either 0 (no possibility at all), or 1 (it definitely will happen). Whether the chances are 1 in 100, or 1 in 10,000, do we really think about the mathematical differences in those situations? No. Instead we tend to treat both of them as if the odds were the same, and, in fact, as if they were both zero. The all or nothing heuristic treats these remote possibilities as if they were, for all practical purposes, “impossible.” That is, as if the actual odds were 0 in 100 or 0 in 10,000.

When we stop and really think about things, there are all kinds of risky situations. A person walking across the street could be hit by a car. But, really, what are the chances? They are in fact *not* equal to zero. But if even the smallest risk of such a great loss as the loss of one's life were perceived, some of us might never venture out into the world. So, we push that decimal point out further and further in our minds, nullifying the risk, treating it as if it were not present at all. I've ice-skated hundreds of times, so what are the chances that tonight I'll fall and crack my skull? There are thousands of commercial flights each day, so what are the chances of a near miss involving my flight? Sadly, if one of those remote and unfortunate possibilities were to occur, we often think, “I never thought that would happen to me.” A main advantage to the all or nothing heuristic is that it balances the paralyzing influences of loss and risk aversion.

Interrogation – From Confrontation to Confession

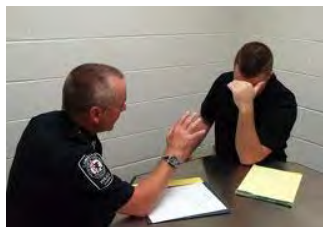
Have you ever been interrogated by law enforcement personnel, or have you ever interrogated a suspect? Interrogations involve asking a person several times to repeat what they saw, heard, or did. By repetition details emerge, details which can exonerate an innocent person and which can trip up a guilty person. Repetition can be frustrating and fatiguing, and it tends to reinforce memories, both true and false. Fatigue and frustration are tools that investigators use to break down a suspect’s defenses. There is an effective process, known as the Reid technique that interrogators use to move a suspect to confess. At each step in the process both parties are making System-1 and System-2 decisions about what to ask or how to respond.

All things being equal, the advantage goes to the interrogator because the interrogator can follow a proven process and because the interrogator does not have to make claims or give reasons. And, because if the interrogator makes a false statement, there is no downside other than that the person being questioned will realize that perhaps the interrogator is lying. As fatigue sets in the person being questioned, however, falls back on snap judgments and unreflective heuristic thinking. When the interrogator unexpectedly shifts topics or buries a damning assumption deep within a false dilemma, the suspect may agree to something or admit something that implies guilt. Since more crimes are solved by confessions than by forensic evidence, the Reid technique is a powerful and important law enforcement tool. It works so well that its critics say it produces too many false confessions, particularly if applied to children.

The playing field is leveled a bit if the person being questioned knows the nine step process. The person being questioned knows what the interrogator is trying to do and where the questioning is going to go next. Remember as you read the steps in the process that it is legal for the police to lie to a person suspected of a crime, just as it is mandatory that the police inform the person of their rights, including their right to remain silent and to have legal counsel present.

1. Confront the suspect by claiming to have evidence that the suspect committed the crime. Offer the suspect the opportunity to explain what happened and why. Build in an unspoken assumption that the suspect did commit the crime. E.g. “What happened out there? Why did you drive away after the accident with the motorcycle?”
2. Offer the suspect excuses or reasons for the crime. “You didn’t know that the motorcyclist was injured, right?” Or, “Were you late for an important meeting?” “I understand, you were just going home so that you could phone in the accident report. Yes?”
3. Do not let the suspect deny guilt. Or, if the suspect denies guilt, do not let the suspect repeat the denial. Denial only reinforces the suspect in the view that he is not to blame. Shift topics if the suspect appears to want to deny guilt.
4. If the suspect offers a reason why he did not commit the crime, attempt to use it to move toward a confession. Ask the suspect to explain in great detail why he could not have committed the crime. If the suspect does not offer a reason, ask for one. Look for inconsistencies. Use any details provided to trip up the suspect.
5. Act as if you are receptive to what the suspect has to say. Appear to be sincere. These are social cues for the suspect to behave in the same way toward you.
6. If the suspect is becoming quiet and listening to the interrogator then move toward offering the suspect different alternative versions of the crime, repeat claims that the evidence is conclusive or that other parties to the offense are implicating the suspect. Interpret crying at this point as implying that the person is guilty.
7. Offer the suspect two options concerning why he committed the crime. Expect the suspect to agree with the more socially acceptable option. But both options imply guilt. The suspect may fail to seize the third option that he is not guilty.
8. Lead the suspect to repeat in front of witnesses his admission of guilt, develop details that corroborate the admission of guilt, and the truthfulness of the confession.
9. Document the confession using video or by getting a written statement.

Source: Zuawski, D., Wicklander, D, et. al., *Practical Aspects of Interview and Interrogation*, Second edition, CRC Press: Boca Raton. 2002.



HEURISTICS IN ACTION

In real-world conversations in which we focus on our own issues, cognitive heuristics expedite our thinking by generating ideas, but not necessarily reflectively. Here is an example of a person explaining why he decided to invest in high-tech stocks in late 2007. What could go wrong?

- “I know some businesses fail, particularly those based on technological innovation. But only 3 percent of new ventures failed last year, so I decided that the risk of failure was actually pretty small [All or Nothing], and I decided to go for broke and invest, and . . . you know. . . I’m pretty good at what I do, and I am really watching things closely now so that nothing happens that will threaten my investment. [Illusion of Control] I just don’t think I can miss on this one.” [Optimistic Bias]

True, it was smart to consider the percentage of businesses that failed, and to do all that one can to run a business well. And the business may not fail, but even the speaker himself would not be likely to invest with confidence were it not for the misuse of heuristic thinking, providing hope, a bit of confidence, and a sense of being in control of the investment. The worldwide economic disaster known now as the Great Recession of 2008 demonstrated that the previous reasoning was a house built on sand.

Often, cognitive heuristics work in tandem with one another. For example, parents often worry about their children getting sick from germs that may be lurking in the environment, like on playground equipment, neighbors’ houses, or in public bathrooms. The gut feeling “Germs = Bad!” is an example of the affect heuristic. Fueled by the illusion of control heuristic, many parents set high standards for cleanliness, especially for their daughters. But research suggests that keeping little girls squeaky clean may in fact be the opposite of what they need.³⁵



In the following example of a casual family conversation over morning coffee, several heuristics are in play, including association, affect, and stereotyping:

- Husband to wife: “I’m looking forward to retiring. I’ve worked for 35 years in offices without windows, and, when I’m retired I want to be outside. I can see myself on the fifth tee right now!”
- Wife replies: “Same as my Dad; he used to say how much he hated the winter especially going to work when it was dark outside, working in a windowless office all day, and then coming home when it was dark.”
- Mother-in-law: “That senior’s apartment you showed me was terrible. Only one window! I need more light. I’m never moving to an apartment! You’re going to have to drag me out of my house.”

In the first paragraph, availability and simulation influence the husband immediately to link the idea of being outside to his vivid and happily remembered hobby [availability]. He sees himself golfing [simulation], projecting how much easier it will be to play golf when retired. As is common with the availability heuristic, he may be overestimating his opportunities to be on the fifth tee. Meanwhile, his wife is still thinking about the original topic, namely retirement. However, she connects her husband’s expressed distaste for his windowless office with her father’s similar expressions of distaste for the same work environment [representation]. At that point the mother-in-law introduces a new topic, her mind having jumped from “windowless” to an association with darkness [association] and from there to her vividly recalled [availability], negative [affect] experience of recently seeing one dark apartment. Clearly, she is overestimating the likelihood that all apartments will be dark. And, given that she has introduced this new topic, rather than join the conversation, this comment has the ring of a bolstering argument for a long-term debate about whether she will agree to move to an apartment. The option of moving to an apartment is off the table as far as she is concerned. And more, not wanting to lose control [loss aversion] over her own life, she expresses her decision to her children—regardless of their obvious age in this context—as a decision she will not permit them to override.

We end this section with an example to remind ourselves that heuristic thinking, while generally useful, can lead to poor decisions too. Consider this true story. A black high school senior was visiting a college campus with two friends on a recruiting trip. One of the university’s white undergraduates accosted the three in the parking lot, questioning their purpose and presence. All the while the student video recorded the younger visitors with her cell phone. The visitors asked why they were being videotaped and the college student replied “just in case”. Offended, disillusioned, and a little bit angry about the WWB³⁶ profiling of the college student, the visitors decided to leave. Moments later the three were coming out of a nearby grocery store only to be met by the campus police who had been alerted by the college student to “suspicious behavior.” A series innocent mistakes and misunderstandings? Perhaps. But one based on stereotyping, association, “Us vs. Them,” and representation on the part of the college student, the visitors, and perhaps the police too.

Heuristics and Possible Errors from Their Misapplication		
Heuristic	Cognitive Shortcut	Possible Error from Misapplication
Satisficing	Having found an option that is good enough, take it. We humans typically do only what must be done to achieve our purposes.	Underestimation of how much is required to satisfy objective.
Temporizing	Decide that a given option is good enough for now.	Underestimation of the growing problems associated with failing to make a long-term adjustment in a timely way.
Affect	Decide based on your initial affective (“gut”) response.	First impressions and gut feelings may mislead.
Simulation	Estimate the likelihood of a given outcome based on how easy it is to imagine that outcome.	Overestimation of one’s chance of success or likelihood of failure.
Availability	Estimate the likelihood of a future event on the vividness or ease of recalling a similar past event.	Mistaken estimations of the chances of events turning out in the future as they are remembered to have turned out in the past.
Representation	Make the snap judgment that X is like Y in every way upon noticing that X is like Y in some way.	The analogy may not hold.
Association	Connect ideas on the basis of word association and the memories, meanings, or impressions they trigger.	Jumping from one idea to the next absent any genuine logical progression and drawing confused and inaccurate inferences.
Stereotyping	From a single salient instance, make a snap judgment about an entire group.	Profiling and misjudging individuals based on one’s beliefs about the group.
“Us vs. Them”	Reduce decisions to the choice between two starkly opposing options and then reject the option your opposition favors.	Unnecessary conflict, disrespect for others, polarization, undermining of the possibility of reasonable compromise.
Power Differential	Accept without question a belief as stated by, a problem as presented by, or a solution as proposed by a superior authority.	Working on the wrong question or problem, applying a mistaken or inadequate solution.

Anchoring with Adjustment	Having made an evaluation, adjust only as much as is absolutely necessary and then only if new evidence is presented	Failure to reconsider thoroughly, failure to evaluate fair-mindedly.
Illusion of Control	Estimate the control you have over events by amount of energy and desire you put into trying to shape those events.	Overestimation of one's actual power to control or manage events—confusion of desire and effort with effectiveness.
Optimistic Bias	The tendency to underestimate our own risks and overestimate our own control in dangerous situations.	Taking unnecessary risks, putting one's self in unnecessary danger.
Hindsight Bias	The tendency to remember successful events as being the result of the decisions one made and actions one took, and to remember past failures as having resulted from bad luck or someone else's mistakes.	Misjudging the actual extent to which one's actions contributed either positively or negatively to past events and outcomes.
Elimination by Aspect	Eliminate an option from consideration upon the discovery of one undesirable feature.	Failure to give due and full consideration to all the viable options.
Loss and Risk Aversion	Avoid risk and avoid loss by maintaining the status quo.	Paralysis of decision making, stuck in the deteriorating status quo.
“All or Nothing”	Simplify decisions by treating remote probabilities as if they were not even possibilities.	Failure to appreciate the possibilities that events could actually turn out differently than expected—the remote possibility may actually occur

Summing up this section,

human decision making uses two cognitive systems: System-1 is reactive and automatic; System-2 is deliberative and reflective. System-1 enables us to get through the routine parts of our lives so automatically that we can focus mental energy on difficult problems using the deliberative and reflective powers of System-2. Heuristic thinking is the often quite useful tendency to rely on highly effective cognitive shortcuts when making judgments. This section examined 17 common cognitive heuristics, noting the advantages and disadvantages of each. At times, we misapply one or more of those heuristic shortcuts and, so, run the risk that our snap judgments will be mistaken. We can avoid System-1 hasty misapplications of heuristics by using our System-2 self-regulation critical thinking skill to monitor and to correct our judgment-making process.

Key Concepts

System-1 thinking is reactive thinking that relies heavily on situational cues, salient memories, and heuristic thinking to arrive quickly and confidently at judgments.

System-2 thinking is reflective critical thinking that is useful for judgments in unfamiliar situations, for processing abstract concepts, and for deliberating when there is time for planning and more comprehensive consideration.

cognitive heuristics are human decision-making shortcuts people rely on to expedite their judgments about what to believe or what to do.

Applications

Two Hours: Today or tomorrow keep a written record of all your actions, judgments, and decisions occurring within a 2-hour window that begins one hour before your main meal of the day. Make eight very brief log entries, one every 15 minutes. For each entry, list all the actions, judgments, and decisions you made in the prior 15 minutes. Keep track of what you are doing using your System-1 and System-2 thinking. Continue right up through preparing your meal, eating it, and whatever you do afterward until the 2-hour period is completed. For example, did you send a text, use the lavatory, think about a relationship, make weekend plans, open a can of soda, or talk with a friend? Did you imagine what it might be like to have more money, listen to music, fret over a problem, or go for a run? Whatever you did and whatever decisions or judgments you made, write them down.

Later, after a couple more hours have passed, go back and review your list of all your actions, judgments, and decisions you made. Count the number that you would classify as System-1 and the number you would classify as System-2. Are there any that you classified as System-1 that, in retrospect, you wish that you had reflected about more before acting or deciding as you did? In view of this little personal experiment, are their ways to build more critical thinking self-monitoring and self-correcting into your daily life?

Estimate Your Chances: Watch the local or national news on TV this evening and look for the story in which the victim of a crime, a disease, an economic misfortune, or an accident is interviewed. Don't worry. You'll find that story because, as they say in the business, "If it bleeds it leads." The more empathetic the victim, the better. The more the victim is like you in terms of age, gender, socioeconomic status, the better. On a scale of 1 to 1,000, with 1,000 being "extremely likely," estimate the chances of the same or a similar event happening to you. After making your estimate, check on the Internet to find the actual statistical likelihood that such an event will happen to you. We believe you will find that your chances are less than 1 in 1,000.

Have You Ever Been Profiled? Were you ever the object of someone else's use of the stereotyping heuristic? To answer this, think of a time when you might have been treated a certain way, either positively or negatively, by someone else simply because of something about your age, gender, style of clothing, race, or accent.

Closer to Home: Clubs, community groups, and professional organizations are not immune to the dangers of the misapplication of the Us vs. Them heuristic. On the other hand, the benefits of this heuristic include that it gives people energy and a sense of urgency to be working to defend their own, to compete for resources, and to feel justified in their beliefs and actions. Recall the last decision-making meeting of a club or organization to which you belong. In what ways did the Us vs. Them heuristic influence your group's thinking about people, about threats or opportunities, about problems or issues? Reflect on those influences. How might your group's decisions have been different had it not been for the sense of "Us" vs. "Them" that this heuristic engendered?

Leadership's Challenge—Do Thinking and Motivating Get in Each Other's Way? The capacity to cultivate a group culture that fosters reflective, respectful, and fair-minded decision making and problem solving can be a great asset to a leader. If trusted not to revile, belittle, or ridicule subordinates for their ideas and suggestions, the leader can benefit immensely. Decisions can be openly discussed and refined before being implemented. Problems can be analyzed and options considered, with each person feeling encouraged to bring his or her best thinking forward. At the same time, intentionally

triggering heuristic thinking by using association, “Us vs. Them,” and loss aversion scenarios, for example, can be a powerful tool to motivate people to take action. Based on your own experience, what are some specific things leaders can do to foster a climate that is highly receptive to critical thinking and self-regulation? What are some things that undermine that good climate? Give examples.

Two Decimal Places Too Many? Reflect on how often you approach key decisions with your own personal litmus test, sorting choices by looking for a single flaw or reason to eliminate as many as possible as quickly as possible. For example, reducing the list of job applicants this way, “Let’s eliminate every applicant whose GPA is less than 2.70.” In this example, the first important System-2 question is why should we look at GPA at all, and the next reflective question is why does 2.70 make the cut, but 2.69 not? What is the evidence that GPA is such a precise measure as that? Going back to your own litmus test decisions, apply your critical thinking skills, and ask yourself whether there is good evidence to support using that single criterion as a make-or-break decision point?

Discussion Question—Would You or Would You Not? Make a snap judgment: Yes or No. Suppose you are thinking about having a child and you can be tested for hundreds of genetic diseases that you might pass on to that child. Assume the genetics test is free. Would you be tested? Now, reflect on the judgment you just made. Which heuristics in your case may have influenced you? Was there an element of fear and risk, afraid of knowing perhaps, even a quick association popping to mind about a genetic disease? Did a stereotype come to mind toward which you perhaps felt some aversion? OK, now put that initial snap judgment aside, and consider reflectively what a responsible person who is thinking about becoming a parent would do if given the opportunity. Before you decide this time, first learn more about the potential for genetic tests, and about the options for informed decision making once one has a fuller knowledge of one’s own genetic heritage. Check out the pros and cons of using a commercial genetics ancestry locator company, like 23andMe for example, and research the concerns expressed by the National Human Genome Research Institute.

Discussion Question—How Did You Decide Today? Reflect on the choices you made today—for example, your choices of what you ate at one of your meals. Replay in your minds how you made that decision. Assuming that you are like the rest of us, you probably did not really give equal and due consideration to all of your potential options. That’s OK. Heuristic snap judgments can be good things; for one, they are highly efficient and they conserve time and energy. Think now about the foods that you could have eaten, but decided not to choose. Share with the others in your conversation group the basis upon which you eliminated the ones you did not select. Was it by weighing all the pros and cons of each choice? Or was it via a snap judgment to reject a given option? For example, did association (memory of prior bad experience), affect (“looked gross”), or elimination by aspect (“too large a portion”) play a role in your System-1 decision making? Talk about the choices you did make. Which cognitive heuristics played a role in those? For example, representativeness (“reminded me of something my Mom makes that tastes really good, so I thought this would taste good, too.”), or satisficing (“I was in a hurry and I just grabbed the first thing that looked halfway edible”).

Section 10 Endnotes

¹ Herbert Alexander Simon, *Models of Man: Social and Rational* (New York: Wiley, 1957).

² Facione, P. and Facione, N. *Thinking and Reasoning in Human Decision Making* (San Jose, CA: The California Academic Press, 2007).

³ Thomas Glovitch, Dale Griffin, and Daniel Kahneman, Eds. *Heuristics and Biases: The psychology of intuitive judgment* (Cambridge, UK: Cambridge University Press, 2002); Daniel Paul Slovic Kahneman, and Amos Tversky, Eds. *Judgment under Uncertainty: Heuristics and Biases* (Cambridge, UK: Cambridge University Press, 1982); Steven A. Sloman, “Two Systems of Reasoning,” *Heuristics and Biases: The psychology of intuitive judgment*, Eds. Thomas Glovitch, Dale Griffin, and Daniel Kahneman (Cambridge, UK: Cambridge University Press, 2002) 379–396; Daniel Kahneman and Dale T. Miller, “Norm theory: comparing reality to its alternatives,” *Heuristics and Biases: The psychology of intuitive judgment*, Eds. Thomas Glovitch, Dale Griffin, and Daniel Kahneman (Cambridge, UK: Cambridge University Press, 2002) 348–366.

⁴ My research colleagues and I recommend avoiding use of the word *intuition*. We are puzzled by claims of justified true beliefs—knowledge—that go beyond observations or direct personal experience and yet are not preceded or preconditioned by some degree of interpretation, analysis, or inference, whether reflective or unreflective. Perhaps there is such a thing as intuitive knowledge, ineffable, immediate, mystical, and true. Even so, by definition such knowledge, if it is indeed knowledge, is beyond the scope of inter-subjective verification and science. That which is said to be “known” by intuition is, by definition, placed outside possible connections with other evidence-based, replicable, or falsifiable knowledge. Hence, other humans cannot, in principle, confirm or disconfirm that what is asserted to be known by means of intuition. “Special knowledge,” available only to one, is always and ever to be suspect. Healthy skepticism demands that it be rejected. We respectfully decline to drink that Kool-Aid. Another reason we have deep ethical concerns about appeals to “intuition” as a basis for justifying beliefs as true or

“Snap Judgments – Risks and Benefits of Heuristic Thinking” – Think Critically, Facione & Gittens

decisions as reasonable is that we seek accountability for knowledge and for action. In matters of importance, including the decisions made in professional practice contexts—such as medicine, law, government, business, and the military—some appeal to “gut feelings” or “intuition” because they are either unable or unwilling to explain their judgments. In effect, they seek the cover of “intuition” because they do not wish to explain their judgments, they cannot explain their judgments, or they do not want to permit others to evaluate those judgments or those explanations. How do we know this? Our research team includes people with many decades of professional practice experience involving health care, management, legal, and leadership responsibilities. We realize the fundamental inadequacies of appeals to intuition and gut feeling. These experiences, in part, motivated us to look more deeply into decision making.

⁵ Croskerry, P. “Audio Interview,” *New England Journal of Medicine*, 2013. 368: 2445–2448. June 27, 2013.

⁶ Croskerry, P. “Audio Interview,” *New England Journal of Medicine*, 2013. 368: 2445–2448. June 27, 2013.

⁷ Shelly E. Taylor, “The availability bias in social perception and interaction” *Judgment under Uncertainty: Heuristics and Biases*, Eds. Daniel Kahneman, Paul Slovic, and Amos Tversky (Cambridge, UK: Cambridge University Press, 1982) 190–200; Baruch Fischhoff, “Attribution theory and judgment under uncertainty,” *New directions in attribution Research*, Eds. John. H. Harvey, William John Ickes, and Robert F. Kidd (Hillsdale, NJ: Erlbaum, 1976); Herbert Alexander Simon, *Models of Man: Social and Rational* (New York: Wiley, 1957).

⁸ Gerd Gigerenzer, Jean Czerlinski, and Laura Martignon, “How good are fast and frugal heuristics?” *Heuristics and Biases: The Psychology of Intuitive Judgment*, Eds. Thomas Gilovich, Dale W. Griffin, and Daniel Kahneman (Cambridge, UK: Cambridge University Press, 2002) 559–581.

⁹ Paul Slovic, Melissa Finucane, Ellen Peters, and Donald G. MacGregor, “The affect heuristic,” *Heuristics and Biases: The Psychology of Intuitive Judgment*, Eds. Thomas Gilovich, Dale W. Griffin, and Daniel Kahneman (Cambridge, UK: Cambridge University Press, 2002) 397–420; Norbert Schwarz, “Feelings as information: Moods influence judgments and processing strategies,” *Heuristics and Biases: The Psychology of Intuitive Judgment*, Eds. Thomas Gilovich, Dale W. Griffin, and Daniel Kahneman (Cambridge, UK: Cambridge University Press, 2002) 534–547.

¹⁰ Oswald Huber, “Information-processing operators in decision making,” *Process and Structure on Human Decision Making*, Eds. Henry Montgomery and Ola Svenson (Chichester, UK: John Wiley & Sons, 1989) 3–21; Allen Newell and Herbert Alexander Simon, *Human Problem Solving* (Englewood Cliffs, NJ: Prentice Hall, 1972).

¹¹ Paul Slovic, Melissa Finucane, Ellen Peters, and Donald G. MacGregor, “The affect heuristic,” *Heuristics and Biases: The Psychology of Intuitive Judgment*, Eds. Thomas Gilovich, Dale W. Griffin, and Daniel Kahneman (Cambridge, UK: Cambridge University Press, 2002) 397–420.

¹² Phillip Waite, “Campus landscaping in recruitment and retention: The package is the product,” Presented at the 2007 annual Noel Levitz conference on enrolment management, Orlando, FL, 2007.

¹³ Business students may be interested in how the Turning Leaf brand applied a “Blue Ocean” Business strategy to this and made tremendous gains in a very competitive market. W. Chan Kim and Renee Mauborgne, *Blue Ocean Strategy* (Boston, MA: Harvard Business School Corporation, 2005).

¹⁴ D. J. Koehler, “Explanation, Imagination and Confidence in Judgment,” *Psychological Bulletin* 110 (1991): 499–519; S. J. Koch, “Availability and inference in predictive judgment,” *Journal of Experimental Psychology, Learning, Memory and Cognition* 10 (1984): 649–662.

¹⁵ Daniel Kahneman, Paul Slovic, and Amos Tversky, Eds. *Judgment under Uncertainty: Heuristics and Biases* (Cambridge, UK: Cambridge University Press, 1982); Amos Tversky and Daniel Kahneman, “Availability: A Heuristic for Judging Frequency and Probability,” *Cognitive Psychology* 5 (1973): 207–232.

¹⁶ Albert Bandura, “Self-Efficacy: Toward a Unifying Theory of Behavioral Change,” *Psychological Review* 84(2) (1977): 191–215; Albert Bandura, “Self-Efficacy Mechanism in Physiological Activation and Health-Promoting Behavior,” *Adaptation, learning and effect*, Eds. J. Madden, IV, S. Matthisse, and J. Barchas (New York: Raven Press, 1989).

¹⁷ Norbert Schwarz and Leigh Ann Vaughn, “The availability heuristic revisited: Ease of recall and content of recall as distinct sources of information,” *Heuristics and Biases: The Psychology of Intuitive Judgment*, Eds. Thomas Gilovich, Dale W. Griffin, and Daniel Kahneman (Cambridge, UK: Cambridge University Press, 2002) 103–119; Daniel Kahneman, Paul Slovic, and Amos Tversky, Eds. *Judgment under Uncertainty: Heuristics and Biases* (Cambridge, UK: Cambridge University Press, 1982) 11.

¹⁸ Daniel Kahneman, Paul Slovic, and Amos Tversky, Eds. *Judgment under Uncertainty: Heuristics and Biases* (Cambridge, UK: Cambridge University Press, 1982); Irving Lester Janis and Leon Mann, *Decision-making: a psychological analysis of conflict, choice, and commitment* (New York: The Free Press, 1977).

¹⁹ Paul Rozin and Carol Nemeroff, “Sympathetic magical thinking: The contagion and similarity ‘heuristics.’” *Heuristics and Biases: The Psychology of Intuitive Judgment*, Eds. Thomas Gilovich, Dale W. Griffin, and Daniel Kahneman (Cambridge, UK: Cambridge University Press, 2002) 201–216; Daniel Kahneman and Shane Frederick, “Representativeness Revisited: Attribute Substitution in intuitive judgment,” *Heuristics and Biases: The Psychology of Intuitive Judgment*, Eds. Thomas Gilovich, Dale W. Griffin, and Daniel Kahneman (Cambridge, UK: Cambridge University Press, 2002) 49–81. In the early heuristics literature, “representativeness” covered a wide range of things. Here we use “representation” as the name for some and “association” as the name for others. At times, these heuristics are found in the literature under the title “similarity.”

²⁰ Ball, J. “Stereotypes ‘evolve like language,’ say researchers.” *BBC News–Science & Environment*. Sept. 8, 2012.

²¹ “Bigotry against Jews and Muslims on the rise, says US” *BBC News–US & Canada*. May 20, 2103.

²² Katrandjian, O., “Illegal Alien Who Saved Child is Center of Debate on New Policy for Illegal Immigrants,” *ABC News*, Aug. 20, 2011.

²³ Deborah Solomon, “Questions for Ayaan Hirsi Ali, The Feminist,” *New York Times Magazine*, May 21, 2010, p. 14.

²⁴ Wyant, A.M., “Offering hope by the bucket,” *Tip of the Spear*, MacDill AFB: US Joint Special Operations Command. April 2012.

“Snap Judgments – Risks and Benefits of Heuristic Thinking” – Think Critically, Facione & Gittens

²⁵ Dualistic thinking divides the world into black and white with no shades of gray. For dualistic thinkers, all problems have right answers or wrong answers only. But psychological dualism is a broader construct. It is better understood in the context of cognitive development. The “Us vs. Them” dynamic, as cognitive heuristic, can influence decisions made by people whose cognitive development has progressed beyond dualistic thinking in many domains.

²⁶ David Berreby, *Us and Them: Understanding Your Tribal Mind* (New York: Little, Brown and Company, 2005).

²⁷ Robert J. Robinson, Dacher Keltner, Andrew Ward, and Lee Ross, “Actual vs. assumed differences in construal: ‘Naïve Realism’ in intergroup perception and conflict,” *Journal of Personality and Social Psychology* 68 (1995): 404–417.

²⁸ Amos Tversky and Daniel Kahneman, “Judgment under uncertainty: heuristics and biases,” *Science* 185 (1974): 1124–1131; Gretchen B. Chapman and Eric J. Johnson, “Incorporating the irrelevant: Anchors in judgments of belief and value,” *Heuristics and Biases: The Psychology of Intuitive Judgment*, Eds. Thomas Gilovich, Dale W. Griffin, and Daniel Kahneman (Cambridge, UK: Cambridge University Press, 2002) 122–138.

²⁹ S. C. Thompson, W. Armstrong, and C. Thomas, “Illusions of control, underestimations, and accuracy: A control heuristic explanation,” *Psychological Bulletin* 123(2) (1998): 143–161.

³⁰ Myers, D. “Self-Serving Bias,” in Brochman, J. (Ed). *This book will make you smarter*. New York: Harper Perennial, p. 37.

³¹ T. R. Schultz and D. Wells, “Judging the intentionality of Action-outcomes,” *Developmental Psychology* 21 (1985): 83–89.

³² Baruch Fischhoff and Ruth Beyth, “‘I knew it would happen’—Remembered probabilities of once future things,” *Organizational Behavior and Human Performance* 13 (1975): 1–16.

³³ Irving Lester Janis and Leon Mann, *Decision Making: A Psychological Analysis of Conflict, Choice, and Commitment* (New York: The Free Press, 1977).

³⁴ James G. March and Chip Heath, *A Primer on Decision Making: How Decisions Happen* (New York: The Free Press, 1994); Daniel Kahneman, Paul Slovic, and Amos Tversky, Eds. *Judgment under Uncertainty: Heuristics and Biases* (Cambridge, UK: Cambridge University Press, 1982); Irving Lester Janis and Leon Mann, *Decision Making: A Psychological Analysis of Conflict, Choice, and Commitment* (New York: The Free Press, 1977); Daniel Kahneman and Amos Tversky, *Choices, Values, and Frames* (Cambridge, UK: Cambridge University Press, 2000); Paul Slovic, “Limitations of the Mind of Man: Implications for Decision making in the Nuclear Age,” *Oregon Research Institute Bulletin* 11 (1971): 41–49.

³⁵<<http://www.npr.org/blogs/health/2011/02/04/133371076/how-keeping-little-girls-squeaky-clean-could-make-them-sick>>

³⁶ Walking While Black