

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 adrenalin 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.

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?

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