



**MINDWARE  
TOOLS  
FOR  
SMART  
THINKING  
RICHARD E.  
NISBETT**

## Mindware

Tools for Smart Thinking

by **Richard E. Nisbett**

Seemingly from my earliest moments, I have had a fascination with numbers and mathematics. The realities of likely job prospects served to focus that fascination more in the direction of applied, as opposed to theoretical, mathematics. Additionally, some of my least motivating teachers in my early years were my math teachers, making a career as a teacher of mathematics quite unattractive. I could never understand how something so fascinating could be made to be so boring and, worse, often unnecessarily frightening for too many of my classmates. Somewhere during my mathematical indoctrination, I was introduced to an interesting quote from HG Wells, who in 1892 said: "Statistical thinking will one day be as necessary to citizenship as the ability to read and to write." Several decades later that HG Wells quote began to take on a renewed relevance in my thinking due in no small measure to my most recent fascination, neuroscience. As we consider here the interesting work of Prof. Richard E. Nisbett, [Mindware: Tools for Smart Thinking](#), I encourage you to join me in considering whether the importance of statistical thinking predicted by Wells more than 100 years ago has finally come to pass. Much of that importance has been suggested through the use of brain imaging technology available only in the past 20 years. That technology has allowed neuroscientists to develop a far deeper understanding of brain function, and the concept of interest here, System 1 Cognitive Thinking Errors. Can a solution to those errors be the statistical thinking to which Wells referred? Could Wells' notion of statistical thinking assist us in overcoming our false inferences, unverified assumptions, stereotypes, biases, prejudices, and preconceived ideas and beliefs that lead us to rush to judgments, decisions, and conclusions often to our detriment and those around us?

Much of our initial interest in System 1 Cognitive Thinking Errors grew out of a concern that traditional education was focused too heavily on knowledge acquisition - axioms, theorems, formulas, and principles. While our students are certainly more knowledgeable than in any other time in history, we are accustomed to hearing from employers about their frustration with the abilities of those same students to do something with what they know. While we observed this concern more than 30 years ago, and it was a primary motivator in the creation of CIMBA, it has yet to receive deserved attention in traditional academic environments. Making matters worse, this issue has been further compounded by current technology that has served to reduce our effectiveness in social interactions. While the latter issue (which we label as "Behavior" or "Being") is not the subject of this ABC, the seemingly exponential escalation in the workplace usage of robots, computers, and machines at all levels is certainly accentuating the importance of both in the workplace skill set of the very near future. Let's turn our attention on the former, on cognition, which we label as "Process" or "Doing." In this crucial, critical thinking competency, we include decision-making, problem-solving, situation appraisal, potential problem analysis, innovation, and strategic thinking abilities most prominently. From the mid-90s, we have made consistent use of Kepner Tregoe's Problem Solving, Decision Making rational thinking methodologies. Like HG Wells, Kepner and Tregoe saw the importance of rational thinking, and, like Wells, they may have seriously underestimated the prevalence of thinking errors in virtually all aspects of the human experience. However, at least they both recognized it and understood its

importance.

It was with Prof. Daniel Kahneman's book Thinking Fast and Slow, that the breath of such thinking errors first became generally recognized beyond a few relatively isolated academics. Pulling broadly from the brain sciences, Prof. Kahneman brought the neuroscience concept of dual process theory into the mainstream. While quite foreign to the general public prior to Kahneman, the notion that the brain has two relatively distinct mental processes defining our actions and behavior, that is System 1 or fast thinking and System 2 or slow thinking, is now part of general discourse. It is important to recall that System 1 is automatic, non-conscious, and cannot be shut off. It basically takes in sensory information (mostly from our eyes and ears), and quickly (200 ms) interprets it, makes a decision based on past experience, and implements an action or behavior in reaction. Due to its evolutionary roots, the fundamental decision criteria for our System 1 Circuits is self-preservation. As such, it is not surprising that those circuits have primary control over our flight or fight reactions. Over 95% of our decisions are made in this way, again, below our level of conscious awareness.

Unfortunately, many of those decisions are based on thinking errors that can have serious impacts on our productivity, creativity, and well-being as well as those around us. It is on this thinking process that Prof. Nesbitt focuses his attention and expertise. His most fundamental questions are: How can we make ourselves more aware of the potential for System 1 Thinking Errors in our decisions and what can be do to minimize their influence?

As an initial matter, Prof. Kahneman was asked if he felt we could gain greater control over our System 1 thinking. He replied that he was not very optimistic, but he hoped that if we could at least both enhance our self-awareness of the possibility System 1 Thinking Errors could be influencing our *major* judgments and decisions and take the time to check, progress could be made. He suggested the use of some form of express process as a tool to provide guidance and assistance. In that regard, it is perhaps not surprising that he served for a short time as an advisor to Kepner Tregoe. While Prof. Kahneman identified the issues, Prof. Nesbitt focuses his energies on solutions. It is important to note that both authors admit to catching themselves committing System 1 Thinking errors on a regular basis despite their expertise. However, I want you to take note of the fact that they "caught themselves"--a major step on the way to self-awareness.

As a general summary before getting into more of the detail, I would like to begin by stating that I believe this is the best work currently available on System 1 Cognitive thinking errors and solutions. Over the past decade, and particularly the last ten years, we have begun to realize the depth and consequences of this issue. In that specific regard, I highly recommend both the book and Prof. Nesbitt's online course making use of the book at the University of Michigan.

Let's go back a step. In reality, there are two general categories of System 1 Thinking Errors: *Cognitive*, the topic of this ABC, and *Emotive*. By System 1 Emotive Thinking Errors, we are essentially referring to *deceptive brain messages*. We make general use of Prof. Jeffrey Schwartz's definition of deceptive brain messages as "false or inaccurate thoughts, or unhelpful, distracting impulses, urges or desires that take you away from your true goals and intentions in life." Common examples would include: "I am not good enough," "I am going to fail," "The others are thinking I am unintelligent." This kind of thinking, while widely experienced in our everyday lives, is difficult to extract in a laboratory setting. In large measure, it was for that reason we created our LIFE Experience.

On the other hand, the general nature of System 1 Cognitive Thinking Errors can be easily illustrated through what are generally labeled as brainteasers; those of you who have experienced LIFE can identify with the Moses Illusion, Joe and Mandy, and the bat and ball examples we used to demonstrate them (and which you most certainly failed). But Prof. Nesbitt takes us far beyond mere brainteasers. He shows us how System 1 Cognitive Thinking Errors can adversely affect our social interactions, our receptivity to manipulation by the media (and others), the way we conduct scientific research, and a surprisingly wide variety of everyday situations. He makes the point that virtually every belief about every aspect of our world is based on the countless inferences we make

via System 1 mental, emotional and physiological processes we cannot even observe. Through our System 1 Circuits we are “non-consciously” dependent on a wide variety of mental schemas and heuristics to categorize accurately even the simplest objects and events. We rapidly (and all too confidently) jump to conclusions based on our System 1 Circuits' need to create a narrative out of the "facts" available to it, and then assuming the rest to make the narrative fit (often undermined by a bias toward the negative). And he emphasizes over and over again that such "assumptions tend to be wrong."

Consistent with our thinking with regard to "assumptions tend to be wrong," he makes it clear that, even if they did not tend to be wrong, it is silly to rely on them when it is relatively easy to test them. Within our data-driven coaching system, this is a constant mantra. Those of you familiar with our 6-Columns recognize how this thinking follows our personal development process from Column 4 (Assumptive World) to Column 5 (Testing the validity and reliability of those Assumptions). While clearly illustrating the shortcomings in self-report Assessments intended for that purpose in other coaching systems, he strongly emphasizes (and I fully agree) that such reports are subject to wide variety of errors. But if we measure actual behavior rather than rely on verbal reports, we are far more likely to get a correct answer regarding the validity and reliability of our Column 4 Assumptions. With System 1 silently, “non--consciously,” in play, it is the difference between perceptions driven by assumptions and realities driven by actual data. How can your coaching experience be productive if it is based on false perceptions and not realities? He provides very useful guidelines into how such personal tests should be conducted, suggestions that will certainly make their way into our 6-Columns materials for use by our coaches. Importantly, at the same time, he also cautions us about typical System 1 Thinking Errors that can arise in such personal tests, particularly those errors related to the law of large numbers or regression to the mean or failure to take into account the circumstances or situation of any individual measurement.

With specific regard to those experiments, he justifiably asserts a strong preference for them if the opportunity exists (MBA students, recall time, cost, opportunity discussions in Statistics) in reaching an understanding of an issue over statistical inference based on data others have collected. None of the discussions in those sections of the book will be foreign to those of you who studied statistics in our MBA. (To the others, you do not need a statistical background to be able to read and appreciate the quality of the arguments he makes). As a person involved both in teaching statistics emphasizing the scientific method and in our personal development system, I was particularly pleased to see that while he believes logical thinking is crucial for scientific thought and some kinds of well-defined problems, he also believes dialectical thinking is more helpful for thinking about everyday concerns, especially those involving human relations. Dialectic reasoning is often associated with Socratic dialogue in that it involves considering a variety of viewpoints with the goal being to more closely approach the truth. It sounds a bit like coaching, doesn't it?

In either case, he clearly supports the argument that well-defined experiments are the best source of information and data. While we ask participants involved in our personal development process to take a variety of psychometric assessments (self-reports), our interest is largely in comparing those results with physiological data collected in well-defined experiments. To speak openly, the extent to which they are consistent has a significant impact on the coaching intervention strategy. Experience has shown us that the extent to which those two measures of the same thing differ is highly reflective of the self-regulatory ability of the person. (As to the two measures, consider empathy tested in LIFE versus your self-evaluation; as you consider the likely validity of your self-evaluation, recall the question: Do you see yourself as being below average in your ability to drive a car? Hint: No one is.) A person identified as being low in self-regulatory ability is typically far less open to dialectical reasoning. (By way of illustration of low self-regulatory ability, and taking examples from LIFE, they would likely have eaten the marshmallow in 10 seconds or less, and outwardly expressed their dissatisfaction with being ostracized in the Cyberball, social pain, video game.) With specific regard to the use of data and information, he follows our maxim: You should trust physiological behavior such as heart rate, cortisol output, and the activity of different brain regions more than responses to concrete descriptions of situations followed by self-report

"measures" of expected or preferred actions or behaviors by the person. As importantly, the person's behavior should first be judged in relation to the circumstances or situation rather than on perceived values, beliefs, or traits. We all can appreciate his summary statement in that regard: Whenever possible, do not listen too much to people talk the talk, watch them walk the walk.

As an important summary, Prof. Nesbitt encourages us to understand our belief that we know what goes on in our brains is far wide of the mark. Our System 1 interpretations are often overly influenced by anecdotal evidence, often a single observation that completely ignores the law of large numbers. Our System 1 overreliance on assumptions creates great difficulty in correctly identifying relationships between even highly important events. Worse, once our System 1 has assumed a relationship, we are very likely to see it that way even if there is not one to be seen. In sum, in his own words: "The bottom line for all of this: our beliefs are often badly mistaken, we are way too confident about our ability to acquire new knowledge that accurately characterizes the world, and our behavior often fails to advance our interests and those of the people we care about." The good news: critical thinking skills can be learned, practiced, and developed. Mindfulness will assist by slowing our brains down to give our more rational System 2 circuits an opportunity to assess a situation more carefully and take more prudent courses of action. Before reaching conclusions about the people and activities around us, it is important to collect relevant information with a watchful eye toward how our System 1 may be non-consciously guiding us down an unproductive and unhealthy path. In short, statistical thinking is now as necessary to good citizenship -- followership and leadership -- as the ability to read and to write. Sounds familiar...