

Thinking Whole: Applied Decisional Sciences

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The Best Thinking about Thinking has occurred between 2002 and 2019. People have been thinking about thinking for centuries, if not millennia. For some reason, there has been something of an explosion of thinking about thinking between 2002 and 2019. What might The Israeli Defense Forces, The Nobel Prize Committee, The Oakland A's, the Blinking Man, the 5-minded man, fast think/slow think, and whole think have in common?

They have all played a part in that explosion. They have all contributed to the birth of what we are taking the liberty of calling Applied Decisional Sciences. They have, each and, all pushed our thinking about thinking beyond the cutting edge.

About Applied Decisional Sciences

We believe that Thinking Whole, and the concept of Thinking Whole that spawned it, are playing a small part in that expansion of understanding; particularly when it comes to actionability. We believe our contribution adds the prescriptive dimension to this conversation.

Most books and studies about human decisioning and group dynamics tend to be lightly researched theories and forensics in the form of case studies. For the most part, they are descriptive in nature. In this essay, we propose to offer a brief multi-disciplinary summary of the best of these, followed by an introduction to what we intend to be a more prescriptive approach.

The terminology and the concept of “applied decisional sciences” is something we believe necessary to describe the next frontier of thinking. Most of you have likely heard the phrase “decision science,” which, according to Harvard University is:

Decision Science is the collection of quantitative techniques used to inform decision-making at the individual and population levels. It includes decision analysis, risk analysis, cost-benefit and cost-effectiveness analysis, constrained optimization, simulation modeling, and behavioral decision theory, as well as parts of operations research, microeconomics, statistical inference, management control, cognitive and social psychology, and computer science.

While most fields of research focus on producing new knowledge, decision science is uniquely concerned with making optimal choices based on available information. Decision science seeks to make plain the scientific issues and value judgments underlying these decisions, and to identify trade-offs that might accompany any particular action or inaction.”

The language and the concepts of decision science could apply as readily to machine “thinking” as it might to human thinking; and equally applicable to computer brains and human brains.

Clearly, the Harvard University definition aligns decision science with all things quantitative. Our concern with Thinking Whole and Creating the Future You Deserve certainly needs to build on that framework. At the same time, we feel that what you need to work with to create what is yet to be created needs a grander canvas and a more encompassing mandate. The future is not a mere projection of what has

been, so much as it is a manifestation of intention. A future that is a linear projection of the past is a future that is being neglected

There really is no such thing as a future that is a linear projection of the past; mainly because there is always someone who can influence that projection. That can happen on a global level, at a national level, at the organizational level, and at the personal level. To manifest something new to the universe (or at least your personal corner of that universe), we need get beyond the province of brain. For that we need to optimize our ability to use the entire mechanisms and potentiality of the mind. That is the cornerstone of the field of Applied Decisional Sciences.

We have chosen to use (actually invent) the word “decisional” to differentiate it from the commonly used “decision” as connected with science. That is because we feel that “decision science” has come to mean that which is closer in scope to computers, algorithms, and the largely calculational. Whereas our view is that “decisional sciences” should embrace a very broad multi-disciplinary approach that includes not only hard science, but also the less empirical yet we feel equally valid approaches to thinking about thinking.

The three foundational principles of the field of Applied Decisional Sciences, as we see it, are –

1. The belief that every discipline ever utilized to achieve enlightenment has something useful to bring to the table.
2. The understanding that, as human thinking is intrinsically multi-disciplinary, it logically follows that only a fully integrated multi-disciplinary approach can lead to our best thinking about thinking.
3. The conviction that the best theoretical understanding is that which is translatable into actionable utility.

Will you Create the Future You Deserve? If not you, then who? If not through a moment of genius, then how?

Applied Decisional Sciences: The Cast of Characters and Concepts

Highlights include –

Kahneman/Tversky	2002	Prospect Theory
Michael Lewis	2003	Moneyball
Malcolm Gladwell	2005	blink (Thin Slice Thinking)
Howard Gardner	2005	Five Minds for the Future
Nassim Taleb	2007	The Black Swan
Daniel Kahneman	2011	Thinking Fast and Slow
Nancy Andreasen	2011	The Creating Brain
Michael Lewis	2016	The Undoing Project
Ad Sci Institute	2017	Thinking Whole

Prospect Theory

The modern era of applied decisional sciences can be seen to have begun in 2002. In that year, the Nobel Prize Committee awarded the prize in economics to a psychologist with absolutely no training nor official experience in economics; in the process recognizing and sanctioning a new field – Behavioral Economics.

According to the official citation, Daniel Kahneman was given this recognition "for having integrated insights from psychological research into economic science, especially concerning human judgment and decision-making under uncertainty" along with Vernon L. Smith "for having established laboratory experiments as a tool in empirical economic analysis, especially in the study of alternative market mechanisms".

Kahneman's empirical findings were seen as a challenge to the assumption of human rationality prevailing in the modern economic theory of Neumann and Morgenstern as proposed in 1944. Michael Lewis, author of *Moneyball* and *The Undoing Project* (we'll get to those connections shortly) points out that, while Kahneman shared the Nobel in 2002 with someone with whom he had not collaborated,

Prospect theory was, in fact, the result of a collegial and personal sharing of the minds between Kahneman and Amos Tversky. Unfortunately, Tversky died before the Nobel Committee made its choice and the Nobel Prize is never awarded posthumously.

In Lewis' words (from *The Undoing Project*):

The prospect theory is an economics theory developed by Daniel Kahneman and Amos Tversky in 1979 (as part of their fascinating work for the Israeli Defense Forces) It is the founding theory of behavioral economics and of behavioral finance and constitutes one of the first economic theories built using experimental methods.... contrary to the expected utility theory, which models the decision that perfectly rational agents would make, the prospect theory aims to describe the actual behavior of people.

In the original formulation of the theory, the term prospect referred to the predictable results of a lottery. However, the prospect theory can also be applied to the prediction of other forms of behaviors and decisions. At the risk of grossly oversimplifying Prospect Theory – Tversky and Kahneman were looking for a way to replace irrational human decisioning with something closer to experience-quantified algorithmic models.

In 2011, Kahneman wrote the bestselling book, *Thinking Fast and Slow*, which explains the theory in his terms and shows how it works in real life. That book, which has sold close to two million copies, is the subject of a subsequent essay in this series..

Moneyball

Having already mentioned Michael Lewis - In 2003, Lewis wrote a 2-million copy seller entitled *Moneyball*; which was made into a popular and star-studded movie starring Brad Pitt in 2011. *Moneyball* described how Billy Beane (who has been credited with pioneering sports analytics) and Paul DePodesta (the real "Peter Brand" of the movie). DePodesta graduated Harvard with a degree in economics in 1995. It is highly plausible and possible that he would have been there exposed to the work of Tversky and Kahneman on Prospect Theory.

It was only after Moneyball, the book, became as popular as it did that Lewis came to learn how many of the ideas presented in his book had actually been generated decades earlier by Kahneman and Tversky. And so it came to pass that a theory that had developed to help Israel make the most of its human military assets, on the basis of how they made and could make decisions, has become one of the cornerstones of sports analysis for major teams in both baseball and American football. Talk about applied decisional sciences at work!

As a kind of “contrition” for not knowing about Tversky and Kahneman’s contributions to behavioral economics, Lewis researched and wrote what ultimately became The Undoing Project. The book not only gave credit where it was due, it also demonstrated how two geniuses, at diametrically opposite poles of personality, were able to collaborate on something that would likely not have been created by either on their own. The story of their collaboration demonstrates how the best thinking can be taken to genius level through a fine balance of collaboration, challenge, and even positive conflict.

Blinking Thinking

“The power of intuitive understanding will protect you from harm until the end of your days.” Lao Tzu

In his 2005 book blink; The Power of Thinking Without Thinking, Malcolm Gladwell (who also authored The Tipping Point, Outliers, and other successful books) introduces the concept of “thin slice” thinking. Most of us would recognize the concept by its other, more common, name – intuition.

The three premises of thin slice thinking are:

1. We do most of our thinking intuitively and intuitive thinking appears to be neither demonstrably better nor worse than long, drawn-out, painstaking, deliberative thinking.
2. Intuitive thinking is not as “snap” or “blink” as it first presents. This is mainly because we can make good decisions quickly, with little information, mainly because of a lifetime of experience that comes before, and is in some way relevant to, so therefore informs, this decision.
3. The biggest downside to thin slice thinking is prejudice. Some belief to which we subscribe can influence, even flaw, a decision; and perhaps entirely invalidate it.

Gladwell is not a psychologist, nor a scientist. He is a journalist who writes on the wide range of topics. Which is likely why he relies so heavily on “for instances” and case studies.

The idea that we can simply “know” some things has been the subject of a great deal of argumentation. So has the idea that our experiences inform our decisions. In ancient Greece, there were two schools of thought. To make the explanation blink-consistent. One school believed that we recognize a table because we have experienced enough tables so that we can use our “table-ness experience” to perceive the essence of table within each new table ex experience. The other school believed that we recognize a table because our minds somehow connect to a universal “form” of the perfect table.

The problem for both schools is, how do we account for round tables, red tables, glass tables, etc. and when is a bench not a table... and so on. Both philosophies agree that we can know a table in a “blink.” The disagreement is how we get to that blinking moment of knowledge.

The Five Minded Man

In 2007, Howard Gardner, a man highly respected for his influence on American education, a preeminent developmental psychologist, and author of *Multiple Intelligences*, *Frames of Mind*, *Changing Minds*, *Creating Minds*, and *The Unschooled Mind*, published a book entitled *Five Minds for the Future*.

He wrote the book, in part, because of what he described as a disheartening observation: even the best-educated students seem unable to explain things about which they might be questioned. His fear was, and presumably still is, that such students may have acquired a great deal of factual knowledge but are proving to be unable to make sense of that knowledge.

His answer to this problem, and the substance of the book, is essentially a return to the traditional liberal education wherein every student was given a sound grounding in the range of human thinking; One that embraced science, mathematics, history, et. al. Gardner's presumption being that only by seeing things in the context, and through the lenses, of different perspectives can the mind truly make sense of information and knowledge; a skill he deems essential to our success in the future.

Howard Gardner makes summarizing his thinking a "snap." "*Five Minds for the Future* outlines the specific cognitive abilities that will be sought and cultivated by leaders in the years ahead.

These include:

The Disciplinary Mind: the mastery of major schools of thought, including science, mathematics, and history, and of at least one professional craft.

The Synthesizing Mind: the ability to integrate ideas from different disciplines or spheres into a coherent whole and to communicate that integration to others.

The Creating Mind: the capacity to uncover and clarify new problems, questions, and phenomena.

The Respectful Mind: awareness of and appreciation for differences among human beings and human groups.

The Ethical Mind: fulfillment of one's responsibilities as a worker and as a citizen.

Gardner draws from a wealth of diverse examples to illuminate these ideas, designed to inspire lifelong learning and also to provide valuable insights for those charged with training and developing organizational leaders. Drawing on decades of cognitive research and rich examples from history, politics, business, science, and the arts, Gardner writes for professionals, teachers, parents, political and business leaders, trainers, and all who prize the cognitive skills at a premium for tomorrow."

Gardner's thinking is consistent with, and mirrors, our own experience with clients and client teams. We have found that the closest thing to "genius" solutions were consistently achieved when we were able to tap into what we call the "collective native intelligence" of the teams, and everyone in those teams, with which we have worked. We need to emphasize that neither Gardner nor we are speaking here in terms of the conventional dimensions of diversity. Our shared notion of leveraging multiple intelligences is more about approaching thinking with different frames of rigor or discipline in thinking than it is about thinking "Polish" or thinking "privileged."

Gardner's (and our) approach would not exclude such perspectives, but those dimensions are secondary to tackling solutions with a disciplined mind, or a synthesizing mind, or a creative mind, or a respectful mind, or an ethical mind, or best of all – all of these disciplines and more in the room. There is no doubt

that a trained engineer will likely approach something differently than a trained artist or a skilled sailor. But consider the exponential possibilities of leveraging all three of those disciplines in one individual. Then multiply that trained mind impact by the number of persons on the team. That is the power of collective native intelligence harnessed to solving a problem or creating a new reality.

Factoring in the Improbable

You can't know what you don't know until you know you know it; but, by now, you should know enough to allow space for what you don't know in your thinking. This statement aligns with the story of Nassim Nicholas Taleb and his tale of The Black Swan. The man is a highly successful, options trader on Wall Street, retired. He has written several fascinating, informative, and challenging books in addition to *The Black Swan: The impact of the Highly Improbable*, *Fooled by Randomness*; *The Hidden Role of Chance in Life and in the Markets*, and *Antifragile; Things that Gain from Disorder*. They all deal with incorporating the unexpected into disciplined thinking.

While Danny Kahneman traffics in the probable, the knowable, and the certain, Taleb concerns himself, clearly, with what lives at the other end of the continuum of certainty. The two men have stretched the dynamics, art, science, and practice of thinking about thinking to wondrous new dimensions.

The men are as different as their theories. There's even a bit of competitive tension in the air whenever they meet. To anyone familiar with Michael Lewis' book *The Undoing Project*, such a push/pull of intellects mirrors Kahneman's relationship with his long-time partner Amos Tversky. According to an account of one of such meeting between Nassim and Kahneman, posted by Jason Voss, CFA in *Behavioral Finance*, the blog of the *Chartered Financial Analyst Institute* -

"Taleb is well known for a parable he tells of a turkey (presumably in the United States) and of a turkey farmer. From the perspective of the turkey, the farmer is a wonderful character, providing endless food, adequate shelter, and ample opportunities for socializing with its kind — until the day the farmer slaughters the turkey for the upcoming Thanksgiving holiday. Kahneman criticized this story by pointing out that Taleb places extreme emphasis on black swan events. After all, every turkey dies, but these turkeys actually have a very good life for all of their days. Kahneman also thought that an explanation for Taleb's intense focus on black swan events was due to one of behavioral economics' chief findings: anchoring. In other words, Taleb is a man with a hammer for whom most problems look like nails."

According to *investopedia*, reviewed by Jim Chappelow updated June 25, 2019

"A black swan is an extremely rare event with severe consequences. It cannot be predicted beforehand, though many claim it should be predictable after the fact.

Black swan events can cause catastrophic damage to an economy, and because they cannot be predicted, can only be prepared for by building robust systems.

Reliance on standard forecasting tools can both fail to predict and potentially increase vulnerability to black swans by propagating risk and offering false security."

“...the term was popularized by Nassim Nicholas Taleb, a finance professor, writer, and former Wall Street trader. Taleb wrote about the idea of a black swan event in a 2007 book prior to the events of the 2008 financial crisis. Taleb argued that because black swan events are impossible to predict due to their extreme rarity yet have catastrophic consequences, it is important for people to always assume a black swan event is a possibility, whatever it may be, and to plan accordingly.

He later used the 2008 financial crisis and the idea of black swan events to argue that if a broken system is allowed to fail, it actually strengthens it against the catastrophe of future black swan events. He also argued that conversely, a system that is propped up and insulated from risk ultimately becomes more vulnerable to catastrophic loss in the face of rare, unpredictable events.”

Examples of famous Black Swan phenomena include the financial crash of the U.S. housing market during the 2008 crisis, Zimbabwe’s hyperinflation in the 21st century with a peak inflation rate of more than 79.6 billion percent, the dot-com bubble of 2001, and the event when the previously successful hedge fund, Long-Term Capital Management, was driven into the ground in 1998 as a result of the ripple effect caused by the Russian government’s debt default, something the company’s computer models could not have predicted.

When it comes to thinking about thinking, Taleb proposes that one big reason we expose ourselves to Black Swans is that crunching data leads to pragmatic simplification. As we make things simpler so that they can be calculable, we end up excluding the improbable and the unknowable. The fact that we exclude them doesn’t mean they don’t exist and doesn’t ensure they won’t present themselves; usually when we least expect them.

Essentially, the argument is that because we believe we are calculating all variables, we create the fiction that we are calculating all there is to calculate. As experience demonstrates, that can prove a dangerous assumption. His arguments support the need for a thinking model with built-in elasticity. This, by the way, is one of the reasons for the tension between Taleb and Kahneman, the ultimate empiricist.

Thinking Fast and Slow

In 2011, some nine years after receiving the Nobel Prize for what was proved to be the foundational work in Behavioral Economics, Daniel Kahneman published a best-selling popularization of his work and his thinking. The title of the book is *Thinking Fast and Slow*. Ironically, it went out into the world six years after Gladwell’s *blink* popularized his [that is, Gladwell’s] version of Thinking Fast, which he recast as “Thin Slice Thinking.” It also came six years after Michael Lewis wrote the story of *Moneyball*, which, he did not realize until after its publication, was actually about how the Oakland A’s used Kahneman’s earlier work with Amos Tversky to redefine how sports teams chose their players and ultimately established the field of sports analytics.

In 2012, *Thinking Fast and Slow* won the National Académie’s Communication Award for best creative work that helps the public’s understanding of topics in behavioral science, engineering, and medicine. Well-written, well-told, and eminently readable, the book describes the two systems we humans use to make judgments and decisions.

What Kahneman calls **System One** (Thinking Fast) is what we use for the vast majority of our decisions. It is rapid, emotional, and intuitive.

Thinking Fast
(System One)

EXPLOSIVE

Impetuous

Insight

Thinking Fast

How it works

The closest thing to actually having a brain “storm,” or at least a brain squall. Explosive. Immediate. Decisive. Leaps directly from the problem to the solution with no stops in between. You just “know” the answer.

The Good News

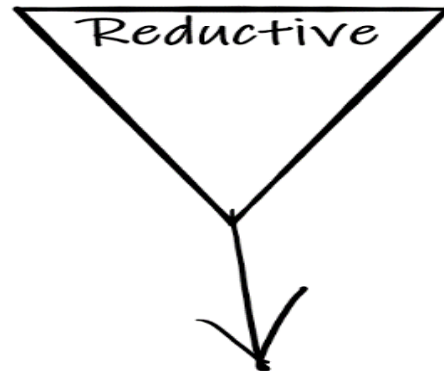
1. *Fast*
2. *Efficient*
3. *Generally dependable*

The Bad News

1. *Thinking Fast can be, and frequently is, affected by prejudices, predilections, and past experience.*
2. *Can't explain to anyone how the insight was arrived at so you can't teach it.*
3. *Can't be certain of replication.*

Thinking Slow
(System Two)

LINEAR



Information
Data
Analysis
Conclusion
Insight
Plan
Action

Thinking Slow

How it works

You start with a lot of material of which to make sense, follow a reductive, linear sequence of processes. Each step in the flow of processing changes the nature of the material processed, driving towards actionable insights. Think of it as a sort of dis-assembly line; at the end of which you end up with considerably less to consider than that with which you started.

The Good News

1. *Calm, steady progression.*
2. *Extensive consideration.*
3. *Communicable and teachable.*

The Bad News

1. *Vulnerability resulting from error or the absence of even a singular datum.*
2. *Simplification can introduce errors of omission.*

3. *Multiplicity of steps open the door to increased opportunity to introduce error.*

The Problem with Fast and Slow, and Thin, et al

Perfectly workable for making decisions or judgments, or evaluations.

Not much help with invention, innovation, creativity, or genius; much less enlightenment.

Attempts at validation of the relative efficacy of either system have basically come up “even;” in that each system proved roughly equally likely to be as often right or as wrong as the other.

All that notwithstanding, Kahneman, and this particular book are foundational not only for the field of Behavioral Economics, but also for furthering our understanding of how we value what we value and how we decide what we decide.

(For the record, Danny Kahneman pretty much prefers the deliberate numbers-oriented Thinking Slow system; as he is not a big fan of human judgment.)

Thinking Whole, The Third Way

Part of the problem with Kahneman’s two-system model, as well as all the other models and concepts described in this book, is the inescapable fact that they are more descriptive than they are prescriptive. None of them end with anything close to a prescription for action such as - “so, in view of this theory, if you do A, you can expect outcome B; and here’s how you get there.”

Even Kahneman, whose claim to fame was in part that the work he and Tversky did, unlike prior models, actually involved experimentation, eventually conceded that those experiments were insufficiently rigorous to pass the test of statistical validity, much less approach the plausibility of clinical trials. This is most often the case in psychological and behavioral studies.

Standing on the Plateau

When it comes to theoreticians, what starts out as pure theory typically tends to remain pure theory. Even many assumptions we believe to be factual in physics are still no more than theory; until the day somebody figures out how to test and validate them. Even if we could conclusively prove the validity, accuracy, and actionability of every one of the theories described above, they are all still relegated to the plateau of decisioning.

Standing on that plateau, off in the distance, if you look very carefully through the mists, a peak rise towards the sky well above the plateau. Its top is not visible; yet it’s clear that there stands something, from the peak of which must be visible a universe of extraordinary vistas – expansive, inspiring, mysterious, and ...waiting to be perceived. This might be the hiding place of Nassim’s black swan; even better, it just might be the high throne of enlightenment.

At the very least, it is the gateway to innovation, creativity, moments of genius, and even genius itself. Not all of the time, but at least once in a while when you need it most, wouldn't it be nice to have a tool, a process, a system you could count on to take you up to that peak of creativity and genius? Wouldn't it be nice to come back down from that peak of genius, each time you ascend it, with an actionable, substantive, beyond-brilliant solution to a problem for which your organization, or team is searching? Honestly, if you had a choice between discerning a potential black swan event before it happens or creating a black swan of your own that helps you achieve new levels of success – which would you choose?

Albert Einstein once said: *“The most beautiful thing one can experience is the Mysterious.”* To our mind, there is nothing quite so intellectually “beautiful” as experiencing, acknowledging, and making use of a moment of genius; especially when you know you can create the next one whenever you need it. The achievement of Invention, creativity, and genius is far more mysterious than mundane decisioning.

Looking Inside the Brain

Nancy Andreasen (author of *The Creating Brain*) has studied this mysterious phenomenon we call genius; along with its frequent companion and accomplice – schizophrenia. Neural scans have proven that the brain of a genius bears striking similarities to the brain of a schizophrenic. Andreasen is uniquely equipped for this inquiry because she brings to it a multi-disciplinary mind (a lot like the desirable collection of “minds” for which Howard Gardner advocates). She is a psychologist and has made enormous contributions to the study, and understanding, of schizophrenia.

Andrea began her intellectual life with a doctorate in English Literature and a particular interest in Renaissance Literature. After the birth of her first daughter, Andreasen had some serious health problems; largely because of which she decided to study medicine – and became a medical doctor. With such a broad-ranging and expansive intellect, it comes as no surprise that she studies creativity, spirituality, neuroimaging, genomics, natural history and the neural mechanisms of schizophrenia.

We judge *The Creating Brain* to be one of the most stimulating things you can read, specifically because of the many simultaneous perspectives it offers on creativity and genius. Andreasen did extensive research into, and interviews with geniuses about, how the genius mind perceives itself.

The “top line” observations one can derive from her studies are:

1. While you can't make genius happen, you can create the circumstances within which it is more or most likely to occur. Mozart said he would get drunk, fall asleep, and wake up with a complete opus in his head. His latter-day counterpart, Neil Simon, routinely went to “some other place,” and came back with his major oeuvres.
2. Genius is something so mysterious and powerful that it can be dangerous if experienced “without a net.” Consider the case of Robin Williams or the tortured life of Vincent van Gogh.
3. The state of being of genius may not be something everyone can achieve. But the action of unleashing creativity at genius levels is teachable and learnable.

What does all this have to do with the subject of this book? Quite a lot, really. Mainly because it connects the dots; and that is what creativity is all about. There is something about this “genius” thing

that stirs more than our intellect. Most of us have a sort of visceral reaction when we are in the presence of somebody who is considered to be a genius.

We can't deny the fact that even thinking or reading about Einstein is akin to touching something ineffable; something mysterious. In our experience, there is a good deal of mystery about how it is possible to get a group of people on the same page and to a level of uncommon brilliance repeatedly, on demand, and consistently within a single meeting.

How it happens may be something of a mystery; that it happens, when we follow a specific process and employ a specific system, is a matter of decades of proof. With all this discussion of thinking about thinking as preamble, the idea of Thinking Whole and the system that makes it happen might make more sense. So, let's get to it in our next essay.