

IV- Asperger and the Ontological Black Swan

Are nerds more blind to swans? Social skills in Extremistan-- On the immortality of Dr. Greenspan

Given that *The Black Swan* is about epistemic limitations, whether errors or true opacity in the process that limits the attainability of knowledge, it is consequently not about some objectively defined phenomenon, like rain, or a car crash --it is simply something that was not expected by a *particular* observer.

So I was wondering why so many otherwise intelligent people have casually questioned whether a certain event, say the Great War, or the September 11, 2001 attack on the World Trade Center, were Black Swans, on grounds that *some* have predicted them. Of course the Sept 11 attack was a Black Swan to those victims who died in it, otherwise they would not have exposed themselves to the risk. But it was not certainly a Black Swan to the terrorists who planned and carried the attack. I have spent considerable time away from the weight-lifting room repeating that *a Black Swan for the turkey is not a Black Swan for the butcher*.

The same applies to the crisis of 2008, certainly a Black Swan to almost all economists, journalists, and financiers on this planet (which, predictably includes Robert Merton and Myron Scholes, the turkeys of Chapter 17), but certainly not to this author for reasons explained in Section I.

Deleted: I repeat

Deleted: ,

Deleted: in short,

Deleted: .

Deleted: From this definition, we can see that

The Black Swan, 2nd Edition (paperback) with new Essay

On Robustness and Fragility © Copyright 2010 by N. N. Taleb

ASPERGER PROBABILITY

This consideration of an *objective* Black Swan, one that would be the same to all observers, aside from missing the point completely, seems dangerously related to the problem of underdevelopment of a human faculty called “theory of mind”, or “folk psychology”. Some people, otherwise intelligent, have a deficiency of such human ability to impart a knowledge to others that is different from their own. These, according to researchers, are the people you commonly see involved in engineering or populating physics departments. We saw one of them, Dr. John, in Chapter 9.

You can test a child for the underdevelopment of the theory of mind using a variant of the “false-belief test”. Two children are shown together. The bigger child puts a toy under the bed and leaves the room. During his absence, the second child removes it and hides it in a box. You ask the subject, where, upon returning to the room, will the older child look for the toy? Those under, say, the age of four (when the theory of mind starts developing), choose the box, while older children correctly say under the bed. At around that age start realizing that someone can be deprived of some the information they have, and hold beliefs that are different from one's own. Now this test help detects mild forms of autisms: as high as one's intelligence could be, it may be difficult for many to put themselves in other people's shoes and imagine the world using their information. There is actually a name for a person who can be functional but suffers from mild forms of autism, the Asperger syndrome.

The psychologist Simon Baron-Cohen has produced much research distinguishing between two polar extremes in people's temperament with respect to two faculties: ability to systematize, and ability to empathize and understand others. According to his research, the purely

The Black Swan, 2nd Edition (paperback) with new Essay
On Robustness and Fragility © Copyright 2010 by N. N. Taleb

systematizing persons suffer from lack of theory of mind; they are drawn to engineering and similar occupations (and when they fail, say mathematical economics); on the other the empathizing minds are drawn to more social (or literary) professions. Fat Tony, of course, would fall in the more social category. Males are overrepresented in the systematizing category, females dominate the other extreme.

Note the unsurprising, but very consequential fact that people with the Asperger syndrome are highly averse to ambiguity.

Research shows that academics are overrepresented in the systematizing, Black Swan blind category; these are the people I called “Locke’s madmen” in chapter 17. I haven’t seen any formal direct test of Black Swan foolishness and the systematizing mind –except for a calculation George Martin and I made in 1998 in which we found evidence that all those finance and quantitative economics professors from major universities that we tracked who got involved in hedge fund trading, ended up making bets *against* Black Swans, exposing themselves to blowups. This preference was nonrandom, since between one third and one half of the non-professors had such style at the time. The most well known ones were, once again, the “Nobel”-crowned Myron Scholes and Robert C. Merton¹³, whom God created so I can illustrate my point

¹³ Robert Merton, the villain of chapter 17, a person said to be of a highly mechanistic mind (down to his interest in machinery and use of mechanical metaphors to represent uncertainty), seems to have been created for the sole purpose of providing an illustration of dangerous Black Swan foolishness. After the crisis of 2008, he defended the risk taking caused by economists, giving the argument that “it was a Black Swan” simply because he did not see it coming, hence the theories were fine. He did not make the leap that, since we do not see them coming, we need to be robust to these events. Normally, these people exit the gene pool --academic tenure holds them a bit longer.

Formatted: Font:Italic, Underline

The Black Swan, 2nd Edition (paperback) with new Essay
On Robustness and Fragility © Copyright 2010 by N. N. Taleb

about Black Swan blindness. They all experienced problems during the crisis, discussed in that Chapter, that brought down their firm Long Term Capital Management. (Note that the very same people who attack me, on grounds of political correctness, for discussing Asperger as a condition not compatible with risk-bearing, and its dangers to society, would be opposed to using a person with highly impaired eyesight as the driver of a school bus. All I am saying is that just as I read Milton, Homer, Taha Husain, and Borges (who were blind) but would prefer to not have them drive me on the A-4 motorway, I elect to use tools made by engineers but prefer to have society's risks managed by someone who is not affected with risk-blindness.)

FUTURE BLINDNESS REDUX

Now recall the condition in Chapter 12 about not properly transferring between past and future, an autism-like condition in humans not seeing second order relations –the subject does not use the relation between the past's past and the past's future to project the connection between today's past and today's future. Well, a gentleman called Alan Greenspan the former Chairman of the U.S. Federal Reserve Bank, went to congress to explain that the banking crisis, which he and his successor Bernanke helped cause, could not have been foreseen because it “never happened before” –not a single congressman was intelligent enough to shout “Alan Greenspan, you never died before, for eighty years; does it make you immortal?” Another Robert Rubin, the banker I was chasing in Section II, a former secretary of the Treasury, used the same argument –but the fellow had written a long book on

The Black Swan, 2nd Edition (paperback) with new Essay
On Robustness and Fragility © Copyright 2010 by N. N. Taleb

uncertainty (with ironically, my publisher and the same staff used for the Black Swan)¹⁴.

I discovered (but by then I was not even surprised) that no researcher ran a test to see whether large deviations in economics can be predicted from the past large deviations, whether they have predecessors –this is one of the elementary tests missing in the field, as elementary as checking if a patient is breathing or if a light bulb is plugged to the outlet, but that characteristically nobody seemed to have tried to do. It does not take a lot of introspection to figure out that big events don't have big parents: the Great War did not have a predecessor; the crash of 1987 in which the market went down close to 23% in a single day could not have been guessed from its worse predecessor, around 10% –and this applies to almost all such events, of course. My results were that regular events can predict regular events, but that extreme events, perhaps because they are more acute when people are unprepared, are almost never predicted from narrow reliance on the past.

The fact that such notion is not obvious in the minds of people is shocking to me. It is particularly shocking that people do what is called “stress tests” by taking the worst possible *past* deviation as an anchor event to project the worst possible future deviation, not thinking that

¹⁴ The argument can be actually used to satisfy moral hazard and dishonest (and probabilistically disguised) profiteering. Rubin had pocketed more than a hundred million dollars from Citigroup earning profits from hidden risks that blow-up only occasionally. After he blew up, he had an excuse –“never happened before”. He kept his money, we, taxpayers, which includes schoolteachers and hairdressers, had to bail the company out and pay for the losses retroactively. This I call the moral hazard element in paying bonuses to people who are not robust to Black Swans, whom we knew *beforehand* to not be robust to the Black Swan. This *beforehand* is what makes me angry.

they would have failed to account for such deviation had they used the same method on the day before that past anchor event. It is indeed the absence of higher order representation --the inability to accept statements like "is my method to assess what is right or wrong right or wrong?" that, we will see in the next section, is central while dealing with probability, that causes Dr. Johns to be suckers for measures and believe in them without doubting their beliefs. They fail to understand the *metaprobability*, the higher order probability, that is, the probability that the probability they are using may not be True.

Formatted: Font:Italic

These people have PhDs in economics; some are professors --one of them is the Chairman of the Federal Reserve (at the time of writing). Do degrees make people blind to these elementary notions?

Indeed the Latin poet Lucretius, who did not attend business school, wrote that we consider the biggest object from any kind that we have seen in our lives as the largest possible item: *et omnia de genere omni / Maxima quae vivit quisque, haec ingentia fingit.*

Deleted:

PROBABILITY HAS TO BE SUBJECTIVE¹⁵

This raises a problem that is worth probing in some depth. The fact that many researchers do not realize immediately that the Black Swan corresponds mainly to an incomplete map of the world, or that some researchers have to stress this subjective quality (Jochen Runde, for instance wrote an insightful essay on the Black Swan idea, but one in which he felt he needed to go out of his way to stress the subjective aspect of it), takes us to the historical problem in the very definition of probability. Historically, there have been many approaches to the

¹⁵ The nontechnical reader should skip the rest of this section.

philosophy of probability. The notion that two people can have two different views of the world, then express them as different probabilities remained foreign to the research. So it took a while for scientific researchers to accept the non-Asperger notion that different people can while being rational, assign different probabilities to different future states of the world. This is called "subjective probability".

Subjective probability was formulated by Frank Plumpton Ramsey in 1925 and Bruno de Finetti in 1937. The take on probability by these two intellectual giants is that it can be represented as a quantification of the degree of belief (you put a number between zero and one that corresponds to the strength of your belief in the occurrence of event), subjective to the observer, expressing it as rationally as he wishes under some constraints. These constraints of consistency in decision making are obvious : you cannot bet there is 60% chance of snow tomorrow and 50% chance that there will be no snow. The agent needs to avoid violating something called "the Dutch book" constraint: the constriction that you cannot express your probabilities inconsistently by engaging in a series of bets that lock-in a certain loss, e.g., by acting as if the probabilities of separable contingencies can add up to more than 100%.

There is another difference here, between 'true' randomness (say the equivalent of God throwing a die) and randomness that results from what I call epistemic limitations, that is, lack of knowledge. What is called ontological (or ontic) uncertainty, as opposed to epistemic, is the type of randomness where the future is not implied by the past (or not even implied by anything). It is created every minute by the complexity of our actions, which makes the uncertainty much more fundamental than the epistemic one coming from imperfections in knowledge.

It means that there is no such thing as a long run for such systems, called "non-ergotic" systems --as opposed to the "ergodic" ones. In an

ergodic system, the probabilities of what may happen in the long run are not impacted by events that may take place, say, next year. Someone playing the roulette in the casino can become very rich, but, if he keeps playing, given that the house has an advantage, he will eventually go bust. Someone rather unskilled will eventually fail. So ergodic system are invariant to the paths taken in the intermediate term; they have what researchers call *path dependency*. A non-ergodic system has no real long term properties.

I believe that the distinction between epistemic and ontic uncertainty is important philosophically, but entirely irrelevant in the real world. Epistemic uncertainty is so hard to disentangle from the more fundamental one. This is the case of a “distinction without a difference” that (unlike the ones mentioned earlier) can mislead because of its distraction from the real problems --practitioners make a big deal out of it instead of focusing on epistemic constraints. Recall that our ability to exert our skepticism are limited.

There is no such thing as a "long run" in practice --what happens before the long run matters. The problem of using the notion of “long run”, or what mathematicians call the “asymptotic” property (what happens when you extend something to infinity), is that it usually make us blind to what happens before the long run, what I will discuss later as “pre-asymptotics”. Different functions have different pre-asymptotics, according to speed of convergence to that asymptote. But, unfortunately, as I keep repeating to students, *life takes place in the pre-asymptote*, not in some Platonic long run, and some properties that hold in the pre-asymptote (or the short run) can be markedly divergent from those that take place in the long run. So theory, even if it works, meets a short term reality that has more texture. Few understand that there is generally no such thing as a reachable long run except as a mathematical construct to

solve equations – to assume a long run in a complex system you need to assume that nothing new will emerge. In addition, you may have a perfect model of the world, stripped of any uncertainty concerning the analytics of the representation, but have a small imprecision in one of the parameters to input in it. Recall Lorenz’s butterfly effect of Chapter 11. Such minutely small uncertainty at the level of the slightest parameter, because of nonlinearities, might percolate to a huge uncertainty at the level of the output of the model. Climate models, for instance, suffer from such nonlinearities, and even if we had the right model (which we, of course, don’t), a small change in one of the parameters, called “calibration” can entirely reverse the conclusions.

We will discuss the argument of preasymptotics further when we look at the distinctions between different classes of probability distributions –I will say for now that many of these mathematical and philosophical distinctions are entirely overblown, Soviet-Harvard-style, top-down, as people start with a model then impose it on reality and start categorizing, rather than start with reality and look at what fits it, in a bottom-up way.

Probability on a Thermometer

This distinction misused in practice resembles another deficient separation discussed earlier between what economists call “Knightian risk” (computable) and “Knightian uncertainty” (uncomputable), which assumes that something is computable and measurable –everything probabilistic is more or less incomputable. One has to have a mental problem to think that probabilities of future events are “measurable” in the same sense that the temperature is measurable by a thermometer. We will see in the following section that small probabilities are less

The Black Swan, 2nd Edition (paperback) with new Essay
On Robustness and Fragility © Copyright 2010 by N. N. Taleb

computable, and that this matters when the associated payoffs are consequential.

Another deficiency I need to point out is about a strangely unrealistic and unrigorous research tradition in social science called “rational expectations”, in which observers are shown to rationally converge to the same inference when supplied with the same data, even if their initial hypotheses were markedly different (by a mechanism of updating called Bayesian inference). Why unrigorous? Because one needs a very quick check to see that how people do not converge to the same opinions in reality, partly, as we saw in Chapter 6, because of psychological distortions, such as the confirmation bias causing divergent interpretation of the data. But there is a mathematical reason why people do not converge to the same opinion: if you are using a probability distribution from Extremistan, and I am using a distribution from Mediocristan (or a different one from Extremistan), then we will never converge, simply because if you suppose Extremistan you do not update (or change your mind) that quickly. For instance if you assume Mediocristan and do not witness Black Swans, you may eventually rule them out. Not if you assume we are in Extremistan.

To conclude, assuming that "randomness" is not epistemic and subjective, or making a big deal about the distinction between "ontological randomness" and "epistemic randomness" implies some scientific autism, this desire to systematize, and a fundamental lack of understanding of randomness itself. It assumes that an observer can reach omniscience and perfect knowledge of what there is to know and has abilities to compute odds with perfect realism and without violating consistency rules --what is left becomes "randomness", or something by another name that arises from aleatory forces that cannot be reduced by knowledge and analysis.

The Black Swan, 2nd Edition (paperback) with new Essay
On Robustness and Fragility © Copyright 2010 by N. N. Taleb

There is an angle worth exploring: why on earth do adults accept these Soviet-Harvard style top-down methods without laughing, and actually go to build policies in Washington based on them, against the record, except perhaps to make readers of history laugh at them by diagnosing new psychiatric conditions? And, likewise, why do we default to the assumption that events are shared by people in the same manner? Why did we ever take notions of "objective" probability seriously?

After this foray into the psychology of the dynamics of time and events, let us get into our central point, the very center of our program, into what I have aggressively called the most useful in the history of philosophy. The most useful, sadly.