All.Net Analyst Report and Newsletter

Welcome to our Analyst Report and Newsletter

Thinking more clearly

When I was young, I imagined reading all of the books in the library. Then I went to the main branch of the Carnegie Library in Pittsburgh, and started to think I might not make it. From the wealth of information now available to anyone with an Internet connection, each of us can only read and experience so much. And as we see more and more, much of the information is unreliable in that it does not accurately reflect reality. From the fact that I cannot get my birthdate set right on the article about me on Wikipedia (I am apparently not an adequate authority on when I was born), to the fictional identities perpetrated in social networks to move perception, to the massive media blitzes surrounding everything from bath soap to candidates for office, so much of it is deceptive that it's hard to tell the honest mistakes from the outright frauds. And in this context, we use search engines and other tools, that themselves have intentionally induced cognitive bias, to seek out things we might want to read or see or hear about, observe them, and try to fuse them into our thinking. "It's a wonder I can think at all"[1]

Somehow, all this technology that we have should help to free us from the very things that seem to be enslaving us. The marketplace of ideas is indeed rich with vendors, and caveat emptor seems to be the law of the infosphere. The editorial process has been removed, and is being replaced by the popularity process. The memes that survive win the day regardless of any inherent utility they may bring. It's an unstable situation in which people run down a line of group think that largely prevents future refutation because of confirmation bias. New and different ideas are punished and suppressed, not by an oppressive government, although that happens too, but largely by the weight of what seems to make sense over what meets with ground truth.

Ground truth

Here lies the rub. There is a foundational difference in what constitutes ground truth based on the philosophical positions that have been here for a long time. Perception is used to measure the world, and therefore the claim is that perception dictates reality and not the other way around. When I sought to understand this in my youth, I figured I should be able to walk through walls by believing they were not there. What I learned is that I bumped my nose. Now, arguably, I may have not adequately believed to achieve the state of being able to walk through walls. But I figure that even if that was true, most folks aren't up to walking through walls right now, perhaps none. So if we go with the notion that ground truth is the stuff that causes everyone so far to bump their nose, it's practically the same as if it were really the truth. Which brings us to the scientific approach.

Using science

The scientific approach, in the broad, involves making specific and measurable predictions based on a theoretical notion of cause and effect, and performing repeated tests by independent parties to try to refute those theories. Predictions must be time limited, and produce effects within measurable bounds of accuracy based on the theory of measurement

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1   Paul Simon - "Kodachrome"

associated with the measurement devices and mechanisms, all as specified in advance of the experiments. Repetitions may be done by anyone who has the publicly available knowledge of the science and the necessary background to carry out the technical aspects of the activities.

As an example of non-science, let's assume that palm readers are claiming to be scientific (which they are not). Perhaps they might claim that a lifeline (a particular crease in right hands) with more crossing ridges indicate more deaths of close relatives at times linearly related to the life of the individual.

> *I am not a palm reader, but one of the reasons they are not scientists is that they do not make such predictions as a rule. Rather they tend to predict things like that a line joining your life line represents an important relationship, and a later line leaving the life line represents the loss of that relationship. Since the definitions of these relationships are undefined, the person being read can identify the outcomes after they occur (retrospectively) or apply them to any relationship (unclear effects), etc. they are not scientific*

Such a scientific prediction could be measured over generations, given adequate definitions of and common training around what crease the lifeline is, what constitutes a crossing, etc. We could measure the location of the lines with defined accuracy, identify "close relatives" as genetically close (3rd cousin or closer?), and so forth. This is how, as a society, we might be able to come to rely on palm reading – or not – depending on the experimental outcomes.

But we can't all be scientists all the time

It's not that the world could not exist if everyone practiced science for the things they relied upon. We might well be able to. And of course scientists are not doing scientific experiments all the time. They rely on love and friendship just like anyone else, and they don't, as a rule, measure their friendships or loving relationships through the lens of science. But in trying to deal with the massive quantities of available information in making good decisions, without the use of some method based on the same principals, results seem likely to be disastrous.

Since we can't all be scientists, those of us that have to make decisions without all of the scientific knowledge associated with every aspect of the decision (all of us) have to find another way. And because the nature of the human world is competitive as well cooperative, it seems likely that those who make better decisions will be more prosperous, in the large and all other things being equal. Perhaps that's just the definition of better decisions. I have a theoretical notion that better information (closer to ground truth) produces better decisions in this regard. I have a theoretical reason and limited experimental evidence that supports it. But rather than try to present them, I will just say that I don't bump my nose as often as I used to.

The question is, what is the better way to make decisions?

Consensus

The scientific community has been embraced by the legal community through the lens of expert witnesses. While many may complain about the legal system, it can be reasonably said to have kept society from anarchy for a long time, the proof coming from places where there is no such system. When the legal system embraces science, over the long term, justice seems to be more common, even if pseudo-science and perjurers continue to be problematic.

The legal system uses expert witnesses to testify about and give opinions on issues where the triers of fact don't know enough to make their own judgements or decisions. One form of the definition of an expert in this context is "someone who knows more than you" about a given subject. Expertise is judged based on knowledge, skills, training, education, and experience, and these have to combine to an adequate level to satisfy the judge that you are qualified to testify as an expert on the particular issues at hand. An expert qualified in digital forensics is not necessarily (or normally) qualified in DNA analysis.

A scientific expert cannot legitimately express mere opinions as facts. They are required to properly apply a scientific methodology. A palm reader may testify as an expert about palm reading, but not as an expert on scientific issues, unless they are also qualified as a scientist in the relevant discipline. The scientific methodology used in expert testimony is supposed to be based on a consensus in the scientific community of interest surrounding the methodology being applied. The notion is that a methodology that has been peer reviewed and found to meet a level of consensus in the community of scientists is adequately reliable to be used as a basis for the legal system making decisions.

But the legal system, at least in the US, also has another useful component to balance this trust in scientific consensus. It is an oppositional system of justice. Whatever one expert asserts, another expert can challenge. When properly applied, supposed experts who do not use methodologies that are at consensus levels, who are not well qualified to testify on the issues in the matter at hand, or who express opinions not based on science, will not be allowed to testify, or will have their testimony strongly challenged. While experts who do apply consensus level scientific methodologies properly may still be challenged, the challenges are likely to be at the edges of their opinions, and not go to the core of what they did.

Trust

We may follow the legal system's precedent and use an oppositional approach and system with experts for making better decisions, and for important and high-valued decisions this is probably a good approach. But most people most of the time can't reasonably be expected to undertake such time, expense, and effort in order to interpret what they read on the Internet or see in Web videos. Of course when it doesn't matter all that much, less diligence may be needed, but the aggregated effect of all the low diligence information may well add up to make for bad decisions across the much wider space. Free speech and the open market place for ideas are highly desirable by most folks, and this brings us to the quandary we all face. What should we believe?

The answer most commonly applied here is to ask a different question. We decide that since "what to believe" is too hard to get at, we will use "who to believe" as a surrogate. Thus we apply trust in favor of science and evaluate trust over time. Which is to say, in effect, editorial content leads to what we believe and how we gain clarity around issues. But there is a problem with this approach. Those who read the New York Times get their viewpoint along with their review of the facts. A different viewpoint, and sometimes different facts are available from the Washington Post. And these are only the big media outlets. If I want medical information, where should I go? WebMD perhaps? Or my doctor? The former is free and has a lot of information immediately available from a lot of supposedly trustworthy sources. The latter is supposed to be more definitive and is certainly more personal, but I only get one opinion, it takes time and costs money, and I often get referred to someone else I don't know.

Systems to bolster trust

Trust in the medical community stems from a variety of things. There is a licensing process and required education, training, experience, and skill. All of this is separated into specialties with years of study required and community consensus around standards of care and large-scale scientific investigation and feedback to force the system to improve with time. Only board certified medical practitioners are normally associated with hospitals, and they generally tell you to speak to someone in a different area when they reach the edge of their area of expertise. They work together to address complex situations and they save a lot of peoples' lives and keep a lot of people more able as a result.

Trust in the air travel system is built upon their outstanding record of performance in terms of deaths and injuries per miles flown. This stems from the National Transportation Safety Board (NTSB) and the system of ongoing improvement they have helped to put in place. In essence, this system seeks the root cause of all crashes and incidents and requires that they be eliminated as future causes by retrofitting and changing processes for all aircraft and airlines flying in the US. The net effect of this process over the years has been to nearly eliminate air crashes as a cause of death, and on a per passenger mile basis, to make air travel safer than almost anything else you can think of. It might be safer than sleeping in your own bed at night.

Trust and deception

Unfortunately, deception is often used to defeat trust. Deceptions like the recent Oracle fake emergency patch that exploits the trust in the vendor to fix a security hole and produces such a hole. Deceptions like the long con that builds up trust over time in order to take advantage at large scale later on. And deceptions like the athletes who claim innocence for years when accused of cheating, then admit that they cheated all along, only to be replaced in their trophies and prizes by others who often also cheated all along but didn't get caught.

Summary and conclusions

All this trust stems from the basic premise of science. Hypothesize causality and test against reality. Trust in people, just like trust in systems, comes from experience. The best predictor of future performance is past performance – that is the premise. While it may be philosophically questionable, in reality, if you don't want to bump your nose, this has a long history of working. Until it doesn't.

But even in its failures, science adapts, seeking better models of reality that do a better job of predicting. Psychological factors are brought to bear in the evaluation of things people say and write, and analysis starts to get embedded in the processes used to search for and evaluate information. Consistency analysis and automated reviews of many documents with associated trust attributes for the authorship and sourcing are likely to come soon. Cognitive interfaces that show the likely sources of errors and misimpressions and help to resolve them could be here with relatively small investments and visionary interest. Tools are already emerging to detect and mitigate commonly known cognitive error types. Reputation systems are in widespread use for limited applications like barter sites, Amazon outside vendors, and many social media venues. The old boys network is turning into the new global network, and trusting the reputation systems will increasingly be the issue at hand.

We have a long way to go. For now, you have to learn to defend yourself by being skeptical or suffer the consequences. "Trust but verify" remains the status quo, but help is emerging.