

Truth, Truthiness and Post-Truth, by Michael R. Clark (Lambton College)

William Shakespeare is credited with inventing approximately 1700 words still in use in modern English. While he may have invented a word here or there, the majority of the words credited to him were in use well before Shakespeare wrote them down. And increasingly, thanks to computer analysis, it is provable that he wasn't even the first person to record these words, he merely popularized them. When the Oxford English Dictionary was being compiled, the researchers preferred literary origins and if they traced words back as far as Shakespeare, they would assume that was far enough and stop.

Students are faced with what Damien Thompson called "a plague of credulous thinking." Increasingly, they don't know what they're looking for, they don't know what they're looking at, and we're lucky if they know how to find it to begin with. How did the modern information environment evolve, what are the obstacles facing current and future researchers, and what are some the tools that we can make use of to sort through the Truth, Truthiness and Post-Truth? We must contend not with the empirical, but with the contextual, the emotional and the blatantly manipulative. What Andrew Keen described as "a billion personalized truths, each seemingly equally valid and worthwhile... hijacking our time and playing to our gullibility." Provable, reproducible, evidence based Truth remains true; even if you don't believe it, it stays that way. Truthiness, as coined by Stephen Colbert, is the reaction against objective truth. It's the feeling that something is true regardless if the facts contradict it. Post-truth, which in the 19th century was called "yellow journalism" and today it goes by names like "fake news" or "alternative facts", is where objective truths are disregarded entirely in favour of a purely emotional or ideological response as it suits your purpose. "It misrepresents reality by presenting non-facts as facts".

From an academic perspective, in the past, qualified researchers would publish peer reviewed articles to recognized journals, which would then be vetted and selected by subject specialists and librarians for inclusion in a physical collection. With so many steps and apparent experts between the creation of the information and students gaining access, there was a presumption that the information was "good" and that anything "bad" had been filtered out. Throughout the 20th century Information Literacy has been, in one way or another, touted as a primary survival skill for the modern era. With the digital revolution, information has become democratized, and anyone with internet access is deluged with all kinds of data, but they do not necessarily have the skills to interpret and utilize this data effectively. How do we recognize good data in this environment?

When the internet began, it was a tool of the few. When the public first gained access to the World Wide Web, content was still largely restricted to academic institutions. In the early 2000s, the concept of Web 2.0 introduced blogs, social media, RSS feeds and more independent and interactive content. Since this time, the inherent nature of the internet has become not only the ability to access any information you might want, but to interact and share that information with whomever you want. Blogging especially has had a transformative effect on the way information is written and distributed. Professional and amateur writers saw the appeal in a publication system which had minimal oversight and maximum reach. Many different perspectives were now had a voice and an audience, but there was little editorial authority to oversee accuracy. The effect being that, increasingly, the writing took on a more opinion based tone. This new philosophy of reporting was more immediate and more responsive, but not necessarily more reliable. "The free culture of the internet does not recognize the bounds between information and misinformation".

This transition from “old media” to “new media” was not accompanied by a wide spread cultural understanding of this new paradigm. The trust in the procedure of the old model remained, despite that procedure being largely absent from the new model. The effect is that people tend to believe anything they read online, regardless of whether or not it seems true, or is in fact outright ludicrous or satirical. A Pew research study found that 61 percent of millennials and nearly as many older adults use Facebook as their primary source for news, and the danger of this exists in the fundamental structure of social media. Your experience is controlled by your “likes” and you end up creating an echo chamber. Post-Truth manipulators use this to their advantage. They infiltrate a social media bubble with a piece of propaganda meant to illicit immediate emotional reactions, where it goes unchallenged because its content reaffirms a previously held belief. Statistically, you probably are only reacting to headlines that seem to uphold your original opinion. A Columbia university study found that 59 percent of links shared on social media are not read beforehand. This behaviour was highlighted in a piece from the Huffington Post that circulated just after the US election concerning Bernie Sanders. It initially appears to be click-bait, but the content was a condemnation of this share-first, read-never mentality. I would put the question to you, what bubbles do you exist in? Is it small and constricted, or wide and malleable? When you share things, are you sharing the idea, or the content?

In a Stanford study of 7800 middle school, high school and college students across 12 US states, where participants had to gauge the accuracy of various social media content such as tweets and articles, the researchers noted a “stunning and dismaying consistency” in the results. 80 percent of middle school students could not tell the difference between a real news article and an ad made to resemble one. Only 25 percent of the high school students knew a verified account was identified with a blue checkmark beside the user name. And when presented with both a verified and unverified account, over 30 percent of students favoured the unverified account as more reliable. It might be reasonable that, considering their size and influence, Google and Facebook would take a certain responsibility in ensuring that they are presenting the world with accurate information. While both companies have vowed to take steps to curtail the proliferation of fake news, the fact is that neither company have transparent processes by which these claims can be judged. Their algorithms are proprietary. Google results can be manipulated by user behaviours, and differs based on your location, age, gender, language and interests. Millennials have grown up in an environment where Google generates thousands of responses to any question, and expect them to be accurate. According to Ofcom, over 25 percent of British eight to fifteen year-olds believe Google search results to be trustworthy, but their ability to accurately tell the difference between the trustworthy and untrustworthy is abysmal.

What are some the tools that researchers can use to help reduce being taken in by the post-truthers? Unfortunately, a Project Information Literacy study of 8300 undergrads at 25 US colleges reported that only 20 percent sought help from librarians on how to search for data. Additionally, some resources are not as reliable as they seem. It is important to remember though that not all scholarly articles are as scholarly as they seem, and one must remain on guard. From 2010 to January of this year, when it was suddenly shut down without explanation, librarian Jeffrey Beall of the University of Colorado, Denver, maintained a list of 1155 questionable publishers and 1294 problematic standalone journals. These journals threaten “the credibility of science. By faking or neglecting peer review, they pollute the scholarly record with fringe or junk science and activist research”. The list’s existence and it’s dismantling is a reminder that within the scientific community, there are ominous outside influences. Legitimately, there is pressure to publish, publish often, and publish results that garner scientists and

their home institutions attention. There is also very little incentive to test the results of others, as there is no glory in proving someone else correct. It is also important to remember that it is in the best interests of companies to generate “counterknowledge”: information that is demonstrably false but which has the potential to generate significant commercial gains. These types of studies may appear legitimate, until they are scrutinized, at which point their complete disassociation from reality becomes evident.

As a reflection of this changing landscape and more interpretive data sources, in June 2016 the ALA adopted a new framework for information literacy, citing a “rapidly changing higher education environment, along with the dynamic and often uncertain information ecosystem in which all of us work and live, require[ing] new attention to be focused on foundational ideas about that ecosystem”. This ACRL Framework for Information Literacy for Higher Education consists of these six considerations:

Authority Is Constructed and Contextual: the idea that information is evaluated based on the context of its need and use, and that the authority of the creators is dependent on people recognizing that authority.

Research as Inquiry: that research depends upon asking questions and that discovering those answers will lead to new questions, and progress in this manner rather than coming to a definitive end.

Information Creation as a Process: that information is changed based on the method used to create it, and the method used to deliver it.

Scholarship as Conversation: that information can change based on new perspectives, and that only through sustained conversation among the knowledgeable, the informed and the professional, can information take on a shape of “truth”.

Information Has Value: information should be seen as a currency, which can be used to educate, influence and inform. But, that value means that information can be influenced by those with a vested interest in specific outcomes.

Searching as Strategic Exploration: that one should always consider a range of perspectives and positions when seeking out information. Never allow a personal bias to limit the scope of investigating a claim.

In the past, there was a greater expectation to conform to a standard of excellence. Now, thanks to this framework, we must accept that there is no standard, there is a spectrum. The increased flexibility of the framework requires that we be less passive when vetting information and when instructing others in how to identify valid sources. When confronted with any piece of information, we must run a plausibility check against it. When hearing or reading something, we should always ask ourselves, Does that seem right? Is it, at first glance, suspicious in any way? What isn't being included here? Does it seem like there might be something else at play? Could there be an alternative explanation?

Humans empathize with the subject of a story, have a hard time visualizing numbers. But good data is never collected from anecdotes and is never told in the form of an anecdote – this is a favoured trick among politicians. If a piece of information seems too personalized, or contains few specifics and more generalities, this is a good sign that you're being manipulated. If it is using statistics, do the numbers

seem convenient or unbelievable in any particular way? Humans like recognizing patterns in things, but sometimes patterns in data are a sign of manipulation in order to make them seem more acceptable. We like seeing whole numbers, and numbers that end in divisions of five. These make the data feel comfortable, but data is rarely comfortable. It is also worth looking at any research that includes data to see what their sample sizes were. If the sample sizes were not representative, if they were the product of a single study, or if they were subject to gender, racial, economic, or age bias, the results might be less relevant or downright manipulative. Likewise, does the data seem to be purposefully confusing, perhaps blending concepts like averages, probabilities, or percentages? These are the warning signs for which we should all be on alert.

Some examples of when some of these principles and a little information literacy could have helped clarify some misinformation:

In November of 2016, Prof. Stephen Hawking gave a lecture at Cambridge on the subject of black holes and mankind's continued exploration of the universe. After the lecture, when taking questions, he mentioned "I don't think we will survive another 1,000 years without escaping beyond our fragile planet", citing our own advancement as potential cause of our own destruction. This is not the first time he has made such a pronouncement. In 2014, he voiced concerns over the development of AI and in 2012 he cautioned that global warming and nuclear war were clear and imminent threats to mankind. While these warnings are dire, it is important to remember that Hawking is not a climatologist, not an engineer, not a computer programmer or a nuclear physicist. He is a mathematician, cosmologist and a theoretical physicist. His professional output has been focused on black holes and the behaviour of space/time as it pertains to General Relativity. While he is certainly an expert in mathematics and physics, and likely one of the smartest human beings on the planet, he could at best be considered to have an above average understanding of these fields. In this regard he can speak with no more authority than anyone else who does not specialize in this area. His opinion is given additional weight only because of the value we place on his over-all intelligence.

In 1998, Andrew Wakefield published a paper in *The Lancet* drawing a connection between children who received the Measles Mumps and Rubella (MMR) vaccine and later developed autism and a bowel disorder. This paper kicked off, initially in England and eventually in North America, the "Anti-Vaxxer" movement, which saw parents choosing not to give their children vaccinations for fear of them developing autism. Part of Wakefield's evidence was a notable rise in the number of cases of autism since the widespread availability of the MMR vaccine in the 70's. However, the creation of this paper is fraught with ethical and scientific issues. The rise in autism cases can reasonably be explained by a decreasing social stigma for the disease, with doctors more likely to diagnose it and parents more willing to have their children tested. Wakefield, who was a surgeon and not an immunologist, based his study on twelve anecdotal cases, only 8 of which followed his pattern. He published the initial paper without peer review and never followed up his case study with additional data. At the time he published, he was being paid significant funds by a legal team that was preparing a case against MMR. Much later, a researcher working under Wakefield declared that what little laboratory evidence had been presented in the paper had been faked. The only paper in the adjoining years to corroborate the findings was a Japanese paper, of which Wakefield was a co-author. In 2004, *Lancet* retracted the original paper, declaring it "utterly clear, without any ambiguity at all, that the statements in the paper were utterly false". In 2010 Wakefield has his medical license taken away from him in the UK, but the damage had been done. The effect of the Anti-Vaxxer movement is evidenced in a 2016 meta-analysis of measles and

whooping cough studies, finding “The phenomenon of vaccine refusal was associated with an increased risk for measles... vaccine refusal was still associated with an increased risk for [whooping cough] in some populations”. Mumps and rubella have seen likewise increases.

In 1993, a brief article was published in the journal *Nature* which noted that, after listening to a Mozart piano recording, subjects scored slightly higher on a spatial reasoning test. It was a short article – really more of a letter - relaying the results of a single experiment involving 36 subjects and lasting no longer than half an hour. It drew no long term conclusions, only that these subjects responded better to piano music than a tape designed for relaxation or silence as a study aid. In 1997, a pair of books written by Don Campbell titled *The Mozart Effect*, referenced the *Nature* article and earlier French research involving using music therapy on children with learning disabilities. These books created an industry of exposing children to music during early development in order to increase their IQ (most recently with Disney’s *Baby Mozart* series). Florida mandated that all daycares have piano music pumped into rooms, and Georgia declared that all new mothers be given classical music CD’s when they gave birth. The behaviour has since extended to include exposing unborn children to music in the womb. Both a 1999 Union College and a 2007 German Federal Ministry of Education and Research meta-analysis have found that the Mozart Effect is completely nonexistent. Despite this, it continues to be propagated by those with a financial interest.

In September of 2011, a team from the OPERA experiment in Geneva made a startling announcement. They believed they had observed neutrinos travelling faster than the speed of light. This would have meant that the entire model by which scientists describe our universe was wrong. According to Einstein’s General Theory of Relativity, nothing can travel faster than light. The OPERA team could not explain their findings, and submitted them for peer review. They had reached the extent by which they could test their own results, and required other teams at other locations to replicate them. In this way, they would either 1) discover that their findings were false, which meant that something was wrong with their experiment or 2) that their findings were correct, and that an entirely new kind of physics would have to be described to account for the finding. By June of 2012, five independent teams had successfully rerun the OPERA test and concluded that neutrinos continued to move at only the speed of light, not faster. This provided the OPERA team with enough information to release a report detailing the errors that had contributed to their false result.

In the modern environment, we must be more willing to question the information presented to us. This should not be taken as a call to become paranoid and distrustful. That mindset actually promotes the chance that we’ll be taken in by a scam. Rather, a diligent digital citizen must harbour a healthy skepticism. A simple willingness to ask questions and not blindly accept what is given to you. To demand proper procedure, good data and replicatable results. Pair this with an understanding of what constitutes reasonable and truthful information, and to resist falling for an emotional reaction and you are far more protected from manipulation. When we embrace a scientific and informed literacy over a sentimental or calculated appeal, we develop a greater sense of how things really are, and can progress in a healthier way. The more accuracy we demand of our authorities and institutions, then ultimately the more truthful and knowledgeable our society becomes.

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