Chapter 9

Fake News and Fake Research, from the Cave to the Light:

Critical reflection and Literature Review

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Introduction

This chapter focuses on the rise of fake information and fake research, it shows how easy it has become, notably because of the advances in technologies and the advent of social media, to spread lies, to cheat, to plagiarize, to publish fake data and research, and how difficult it is to fight these new threats. There are around 30,000 journals and an average of 2 million articles published per year. But only 20% of scholars around the world become peer reviewers, generally for a short period of time (Bailey, 2019). Therefore, journals and editors need to rely on technology to cope with the fast-growing number of papers published around the world. Bailey (2019) gives a useful list of platforms and high tech tools to help with the reviewing process, including Statcheck; Artificial Intelligence Review Assistant or AIRA and Evise (from Elsevier) are also able to suggest reviewers to contact for each paper submitted.
The huge number of submissions is notably linked to the pressure to publish (Haley, 2017; Moosa, 2018), which has become unbearable for many scholars, not only because obtaining research funding is a growing challenge, but because rejection rates (especially in indexed journals) are getting higher; this situation seems to push some scholars towards various forms of plagiarism and academic malpractice (Necker, 2014; van Wesel, 2016; Fong & Wilhite, 2017; Montoneri, 2018).

This chapter is divided into three main parts. It is both a critical reflection and a literature review, looking at the most recent articles and news related to the rise of fake news and at cases of academic hoaxes, which, according to their authors, were elaborated to expose academic malpractice and problems linked to the publications of papers in some conferences and academic journals.

In part one, I would like to discuss about the notion of truth in Plato’s book, The Republic and reflect on the Allegory of the Cave. According to Plato, education may dispose us towards the truth, by learning reason and logic. If one prisoner can escape from the darkness of the cave and the world of sensory knowledge, he can guide the other prisoners into the light, that is, the world of true knowledge, the world of reality and ideas, even thought they would probably turn on him and refuse to leave the cave.
Part two introduces the expression ‘fake news’, its origins and the consequences of the recent growth of misleading online information. ‘Fake news’ was already used at the end of the 19th century, but 2016 can be considered a turning point as the phrase went viral. We will analyze why people spread false information and how to fight this new threat without jeopardizing our freedom and privacy. In the past three years, things have changed quickly and deeply and most schools have begun to prepare children and students to spot false information online and to develop media literacy and critical thinking.

Part three presents two cases of academic hoaxes. This is an interesting philosophical problem: should we lie and deceive people in order to expose the truth? The first case is particularly important as it is the birth of computer generated papers. Ironically, Stribling, Aguayo, and Krohn in 2005 lied to expose the flaws of some conferences and academic journals (the worst would be to publish a submission without even reading it) and the rise of nonsensical papers. The other hoax is more recent and got more criticism. The so-called grievance studies affair, or “Sokal Squared” scandal (named after Alan Sokal's 1996 hoax in Social Text) had considerable backlash. Many academics praised the hoax for exposing flaws in the fields of the humanities and social sciences, but some accused the authors of the hoax
(James A. Lindsay, Peter Boghossian, and Helen Pluckrose) of conducting academic fraud and dishonesty.

“Truth, above all”

In Montoneri (2016), I discuss the notions of truth and virtue through the ages, notably in the works of Homer, Plato, Cicero, Virgil, Thomas Malory, and Benjamin Franklin. One of my favorite quotes is without a doubt Merlin’s answer to King Arthur in the movie *Excalibur* (1981), the best adaptation of Sir Thomas Malory's *Le Morte d'Arthur* (1485):

Arthur: “Which is the greatest quality of knighthood? Courage? Compassion? Loyalty? Humility? What do you say, Merlin?” [...] Merlin: “All right, then. Truth. That’s it, yes, it must be truth, above all. When a man lies he murders some part of the world. You should know that.”

(Montoneri, 2016, p. 149)

Before we reflect on what happened during the two first decades of the 21st century, perhaps we should go back in time and meditate on what Plato said about the
notion of truth. In this first section, we are going to concentrate on the *Allegory of the Cave* and see how it is still relevant more than 24 centuries later. Plato (around 428–348 BC) is not only credited for being the founder of the Academy in c. 387 BC in Athens (considered to be the first university in the Western world), he is also the student of Socrates (470–399 BC) and the teacher of Aristotle (384–322 BC). Ironically, his master, Socrates, one of the founders of Western philosophy and Western ethical tradition, which emphasizes virtues of mind and honesty, got arrested and trialed in 399 BC and was found guilty of corrupting the minds of the youth of Athens, and sentenced to death. According to Encyclopædia Britannica (2009), “Socrates was indeed corrupting the youth of Athens, though he himself considered the destruction of beliefs that could not stand up to criticism as a necessary preliminary to the search for true knowledge.”

Plato wanted to pursue a career in politics, but after the death of Socrates, he turned to philosophy. In *The Republic* (360 BC), Plato discusses, among other things, the notion of truth. He notably introduces the famous *Allegory of the Cave* in Book VII (514 a, 2 to 517 a, 7; cf. Plato, 1969); Plato has Socrates present an allegory to his student Glaucon (Plato's brother): some people are imprisoned in a cave (“from childhood”, not birth; Plato, 1969, 514a) in which they are forced to watch shadows on a wall in front of them; the cave represents empirical evidence (sensory
knowledge). The prisoners consider the shadows to be real, but they are misled by their senses. Socrates imagines that one prisoner escapes and is able to see the light (the fire, and then the sun), the puppets, and the artists making them move (“It seems most likely that the puppeteers represent the poets and the script followed is the poly and theocentric worldview they sustain in their poetry”, Eckert, 2012, p. 45). Eckert (2012) also notes that the shadow-play is coherent, consistent, and comprehensive, so that the prisoners do not grow suspicious and continue to believe what they can hear and see. True knowledge can only be found outside of the cave, but the process is disturbing and painful. Plato considers that the light (knowledge, the world of reality and Ideas, the non-physical forms) can only be found by crawling out of the cave, that is, by being educated in logical and critical thinking, and by using reason:

[…] in the world of knowledge the idea of good appears last of all, and is seen only with an effort; and, when seen, is also inferred to be the universal author of all things beautiful and right, parent of light and of the lord of light in this visible world, and the immediate source of reason and truth in the intellectual; and that this is the power upon which he who would act rationally, either in public or private life must have his eye fixed (Plato, 1991).
Socrates invites Glaucon to think about what would happen if someone who has lived in the cave for so many years could set himself free. He “would be able to look upon the sun itself and see its true nature” (Plato, 1969, 516b). The prisoner would first see the firelight; then, he would slowly get out of the cave and would gaze directly at the sun, a metaphor for human beings’ ability to conceive of the truth. He would then probably pity the other “strange prisoners” (ibid., 515a) and would try to set them free (ibid., 516c). The prisoners in the cave are passive observers, but knowledge requires a proactive attitude (taking control, being flexible and able to learn from criticism), some courage and determination. Plato believes that most people would be scared and would refuse to trust the philosopher who wishes to enlighten them. The prisoners would be dazzled by the light of the sun. But they would feel pain and anger and would certainly not only distrust, but kill anyone who attempts to drag them out of the cave (ibid., 517a). This is obviously a reference to the fact that his master, Socrates, was forced to kill himself by drinking the hemlock (Frey, 1978, argues that Socrates took the hemlock willingly). As Mark Twain famously said, “The glory which is built upon a lie soon becomes a most unpleasant incumbrance. … How easy it is to make people believe a lie, and how hard it is to undo that work again!” (Twain, 1906). Can people who have been fooled, misled, or brainwashed listen to reason and logic? Can they see the light? How would they react
when exposed to other viewpoints? Why would people prefer to share fake news than true information?

The growth of fake news and misleading information

Fake news in the 21st century

Sir Tim Berners-Lee, a Professorial Fellow of Computer Science at the University of Oxford and a Professor at the Massachusetts Institute of Technology (MIT), is the recipient of the 2016 Turing Award “for inventing the World Wide Web, the first web browser, and the fundamental protocols and algorithms allowing the Web to scale” (Haigh, 2016). In 2017, Berners-Lee warned the world of three disturbing Internet trends and threats: citizen-surveillance, cyber-warfare, and fake news (Swartz, 2017). He notably said that “the current business model for many websites offers free content in exchange for personal data” and that “misinformation, or fake news, which is surprising, shocking, or designed to appeal to our biases, can spread like wildfire” (Berners-Lee, 2017).

Even though the expression fake news is not recent (“Fake news appears to have begun seeing general use at the end of the 19th century”, according to
Merriam-Webster, 2017), 2016 can be considered a turning point, because of the surprising election results in some Western countries, notably the US presidential election (Holan, 2016; Connolly et al., 2016; Guess, Nyhan, & Reifler, 2018), that was integral to ‘Fake news’ going viral in 2016 (Sarlin, 2018). As a matter of fact, “Collins Dictionary’s lexicographers, who monitor the 4.5 billion word Collins corpus, said that “usage of the term had increased by 365% since 2016” (Flood, 2017). The term was selected by Collins as the ‘word’ of the year 2017 (Collins Dictionaries, 2017).

Collins also selected ‘echo chamber’ as one of the top expressions of 2017, defined as a “perfect metaphor for the world of social media, where many people only talk with those who agree with them” (Collins Dictionaries, 2017). At the same time, ‘post-truth’ (Keyes, 2004; Kalpokas, 2019) was selected by Oxford Dictionaries as the word of the year in 2016 because emotion and personal belief seem to have become more “influential in shaping public opinion” than objective facts and because “truth itself has become irrelevant” (Oxford Dictionaries, 2016). According to Picciotto (2018), “The contemporary post-truth phenomenon is characterized by denial of facts and tolerance of politicians’ lies” that appeal to the highly emotively charged beliefs of some of the population.
The use of the expression ‘fake news’ in its modern context

According to the global report for 2017-2018 published by UNESCO (2018), “‘Fake news’ is not simply ‘false’ news.” A lie becomes ‘fake news’ when it gains the ability to travel fast and far, that is, when it is “retransmitted by hundreds of websites, cross-posted over thousands of social media accounts and read by hundreds of thousands” (Bounegru et al., 2017).

Fake news is now part of our daily life (Connolly et al., 2016; Young, 2017). Fake news stories are ubiquitous and pervasive on the Internet and can reach millions (Garcia and Lear, 2016); as to the consequences of spreading lies and false information, they can be dire (Akpan, 2016; Burgess, 2018). What makes this type of misinformation dangerous is both the lack of critical thinking (Wineburg et al., 2016; MindEdge, 2017; Williams, 2017) and the desire to share news, knowledge, and information on social media as quickly as possible, with little to no filtering (“People form an opinion based on a summary, or a summary of summaries, without making the effort to go deeper”, according to Arnaud Legout, cited by Shah, 2016). Legout is one of the co-authors of Gabielkov et al. (2016), which found that 59% of people who share news URLs on Twitter don’t read them. Technology and social media, especially Facebook (Silverman, 2016; Lekach, 2017; Sarlin, 2018) help share fake
news and information. According to Joanna Burkhardt:

Social media platforms like Facebook, Twitter, and Instagram are fertile ground for the spread of fake news. Algorithms known as bots are increasingly being deployed to manipulate information, to disrupt social media communication, and to gain user attention (Burkhardt, 2017).

In fact, according to a study published by Pew Research Center, 67% of Facebook’s users get their news there, as do 71% of Twitter’s users and 73% of Reddit users (Pew Research Center, 2018). Social media news users expect information to be inaccurate; they are especially concerned about “unreliable sources, lack of fact checking, and fake news” (Pew Research Center, 2018).

Sadly, the biggest study ever on the spread of fake news on Twitter (using 126,000 rumors spread by 3 million people from 2007 to 2016), shows that falsehood is “diffused significantly farther, faster, deeper, and more broadly than the truth in all categories of information” (Vosoughi, Roy, & Aral, 2018). A false story “reaches 1,500 people six times quicker, on average, than a true story does” (Meyer, 2018). Falsehood is probably creating a sense of drama…

Young (2008) shows that humor reduces critical argument scrutiny; as most
people have a limited capacity to process information in working memory (Baddeley, 1998; Akpan, 2016), “humor’s effects on persuasion are certain to be influenced by the role of affect” (Young, 2008, p. 123). According to Young, in an interview on PBS News Hour, “the special sauce of humor is that you might get people to entertain ideas of constructs that they otherwise might reject out of hand […] and this powerful mode of persuasion extends to sensational fake news as well” (Akpan, 2016).

Some fake news websites seem to spread false information for financial gain (Silverman & Alexander, 2017); even though they “sometimes publish accurate information, they also frequently publish false claims, distort genuine news reports, and copy or repurpose content from other outlets” (Guess, Nyhan, & Reifler, 2018).

According to Attkisson (2018), a five-time Emmy Award winner and recipient of the Edward R. Murrow award for investigative reporting, a non-profit called First Draft “appears to be the about the first to use ‘fake news’ in its modern context.” She notes that “on September 13, 2016, First Draft announced a partnership to tackle malicious hoaxes and fake news reports” (Heine, 2018). Attkisson’s point is that Google was a founding partner and donor behind First Draft (Abril, 2019) and that Eric Schmidt, the executive chairman of Alphabet Inc. (Google’s parent company) from 2015 to 2017 (he surprisingly resigned at the end of 2017; Heater, 2017), was a generous Hillary Clinton supporter (Heine, 2018). In her Tedx Talk at the University
of Nevada, Attkisson also notes that the fake news narrative was pushed by Democrat politicians in 2016. Ironically, President Trump claimed the expression as his own and using it against the mainstream media and liberal politicians to disseminate truth and fiction alike. CNN (2017) says Trump claimed he invented the term ‘fake news’; he also used it to dismiss criticism against him or his administration (Ross & Rivers, 2018).

“Alternative facts”, an Orwellian sophism

President Trump's campaign strategist and counselor, Kellyanne Conway, in order to defend Sean Spicer's false statement about the size of the crowd at Trump's inauguration on January 20, 2017, coined the expression “alternative facts” in an interview on NBC (Meet the Press with Chuck Todd, on January 22, 2017). Chuck Todd’s reaction was immediate: “Look, alternative facts are not facts. They're falsehoods” (Blake, 2017). A large number of people criticized Kellyanne Conway's use of the expression ‘alternative facts’. Six language experts at Darmstadt University, Germany, chose ‘alternative facts’ as the non-word of 2017, defining it as “the growing practice of replacing factual arguments with claims that cannot be proven” (The Associated Press, 2018). According to Kharpal (2017), Nobel Prize-winning
economist Joseph Stiglitz “expressed dismay at what he described as the undermining of the basis of a common agreement about what is truth”; Stiglitz notably added that: “Now we have an administration that says we have alternative facts. It’s going to be very very difficult to reach a consensus on the way forward if you’re questioning theory, you’re questioning facts.” Cohen (2017) argues that, “for Plato, there can, indeed, be alternative opinions, but not alternative facts because facts are eternal and unchangeable; they exist outside the limits of space and time, and outside of human minds.”

Many called the phrase ‘alternative facts’ Orwellian (Freeman, 2019); personally, it made me think of the Sophists. Actually, I heard about *Sophistry Redux* by Andrew Grosman (Grossman, 2019, notably p. 95) only a few days before I submitted my chapter. In this chapter, I use ‘Sophists’ in its most pejorative sense, that is, Plato’s opinion of them. In fact, most of their writings survived only through the lens of Plato’s judgement in his books: a sophist would be an instructor who teaches deception for a high price. It is difficult to know whether Plato criticizes them fairly, but after all Aristophanes, in *The Clouds* (423 BC), called the Sophists hair-splitting instructors (Strepsiades, an elderly farmer: “How’m I going to learn hair-splitting arguments, all that fancy stuff?”; Aristophanes, 2017, p. 17). Sophism is, in Aristophanes’ play, “an art whose purpose is not to bring objective truth to light, but
to conquer the opponent, regardless of what he defends” (Schell, 1940, pp. 11-12).

This is the core of the issue nowadays: for political or financial gain, some people may resort to deceptive and hair-splitting arguments in order to win their case no matter the moral or ethical cost: “The man of real power, therefore, needn’t be an expert in any single discipline but only a master manipulator […] non-knowers are not merely unbiased by knowledge but are more likely to agree with one who shares their disposition” (Grossman, 2019, p. 98).

Credibility and trust

People expect journalists to report the truth (Kovach & Rosenstiel, 2007; Tandoc, Lim & Ling, 2018). Fake data and fake or distorted news are at a record high and an increasing number of people mistrust not only the media (Knight Foundation, 2018), but also experts and challenge scientific proven facts (“People are prone to resist scientific claims when they clash with intuitive beliefs”, Gawande, 2016). Of course the media share some responsibility in the current situation. After all, if so many people turn away from the mainstream media (Ingram, 2018), it is because of a series of scandals and blatant lies that nobody has forgotten; for example, millions of people around the world remember the infamous “weapons of mass destruction” of
Iraq: “…most American media did not act to check and balance the exercise of executive power, essential to the functioning of a civil democracy” (from Weapons of Mass Destruction and the Media: Anatomy of a Failure by Moeller, 2004). As a result, “no media outlet is considered credible any longer” (Hempel, 2016). Vazquez (2016) sums up the situation quite clearly: “Why do people believe fake news? It's not because it gets shared all over Facebook; it’s because they don't trust mainstream news.”

Children and students lack of preparation to face the flood of fake news

According to Silverman and Singer-Vine (2016), a 2016 BuzzFeed survey shows that “fake news headlines fool American adults about 75% of the time.” As to children and students, they have not been sufficiently educated on these threats and lack media literacy: a 2018 UK survey shows that 53.5% of the instructors “believe that the national curriculum does not equip children with the literacy skills they need to identify fake news, and a third (35.2%) feel the critical literacy skills taught in schools are not transferable to the real world” (National Literacy Trust, 2018). The report notably shows that only 2% of schoolchildren in the UK are able to recognize fake news. Loos, Ivan & Leu (2018), in a replication of a US empirical study in the
Netherlands, show that only 2 out of 27 schoolchildren (7%) are able to recognize that the website Save the Pacific Northwest Tree Octopus (http://chadoh.github.io/tree-octopus/index.html) is a fake. A study made by Stanford University’s History Education Group (HEG) in the US (12 states, 7,804 student responses) focusing on “news literacy, as well as students’ ability to judge Facebook and Twitter feeds, comments left in readers’ forums on news sites, blog posts, photographs and other digital messages that shape public opinion” (Donald, 2016); it shows that most students are not equipped to spot fake or misleading information and have difficulty distinguishing advertisements from news articles: “82 percent of middle school students couldn’t distinguish between a news story and one labeled as sponsored content” (Shellenbarger, 2016). Another study by the Knight Foundation shows that 45 percent struggle to discern real news from fake news (Callahan, 2018).

Solutions to fight fake news

Fighting misleading information is a complex and difficult challenge. Surely, many types of solutions can be implemented. According to Lazer et al. (2017), there are three main courses of solutions to fight fake news in the US: to make the discussion bipartisan and invite conservatives in the debate, to work with journalists
in order to “make the truth louder”, and to conduct new research or replicate prior studies. In this chapter, I present three ways to fight fake news:

**Education**

Research suggests that people with better literacies are more likely to spot and refute fake news (Jang & Kim, 2018; Mihailidis & Viotty, 2017). According to Jones-Jang, Mortensen, & Liu (2019), “information literacy, which emphasizes users’ abilities to navigate and locate verified and reliable information, was positively associated with fake news identification.” Their study shows that the other forms of literacy, such as media literacy, are not positively associated with the likelihood of identifying fake news stories.

According to Zannettou et al. (2018), “a system that can meaningfully assist in detecting false information across multiple formats does not exist” (most studies focus only on one format, that is, pictures, or text, or video). They also add that “a post from an expert on a particular subject should not be treated with the same weight as a post by a typical user.” However, credibility based on user profiling is very subjective and may cause privacy issues. While direct contradiction does not seem to be efficient, Lazer et al. (2017) show that shaming websites which post misleading information is more useful. Moreover, as people are generally “biased information-seekers”, they
prefer information that supports their view. As mentioned before, fake news is “designed to appeal to our biases” (Berners-Lee, 2017). His definition highlights the fact that we are all biased (Kahneman & Tversky, 1973; Kahneman, 2011). Fleming (2019) asks two important questions: “If humans have the capacity for reason, why do we make so many bad decisions? How come people cling to extreme or irrational views in the face of facts?” In a 2014 study, Mercier and colleagues found only 22% of participants could solve a reasoning task on their own, but when small groups discussed their thinking, this rose to 63%. “If people are reasoning on their own or only with people they agree with, nine times out of 10 they will stick to biased positions and you are going to get polarization,” he says. “But if you take a group of people with some kind of common incentive, but who disagree about something, then reason can help them get a better answer.” (Fleming, 2019)

I find the idea of public people shaming very disturbing and we probably need more positive solutions and encouragement to share the truth. Children need to know that if they fight misleading information and share facts, they will be protected and praised. As to scholars, they have to set an example of good behavior so that children can look up to them. Gibbs (2019) argues that academics should be “truth-tellers”.

Many schools around the world have decided to teach children about fake news and how to spot misleading information, especially online. BBC (2019) says
that in the UK, “children in primary school and secondary school will learn about fake news from 2020.” Other countries vow to teach schoolchildren about fake news (Smith, 2017). Finland ranks first out of 35 countries in resilience to the post-truth phenomenon (Mackintosh, 2018). This will, hopefully, have many follow on benefits, such as reducing cheating at school, plagiarism or contract cheating.

Technology

First, there are numerous fact-checking sites available, such as Snopes, Politifact, and FactCheck.org. In Finland, for example, fact-checking agency Faktabaari (FactBar) created a digital literacy “toolkit” for students (Mackintosh, 2018).

Second, we can use platforms like Statcheck and high tech tools to help with the reviewing process to make sure scientific knowledge is valid, accurate, and reliable. Journalists must make sure they don’t share academic hoaxes, fake papers, and fake data in their newspapers.

Despite the fact that, according to Shao et al. (2016) and Ferrara et al. (2016), “social bots” have become influential in spreading fake news online, Artificial Intelligence and bots may also help detect and flag them. Artificial Intelligence
Review Assistant or AIRA, Evise (from Elsevier) and many others can, not only check submissions, but also suggest peer reviewers. It might also be useful to revise some of the algorithms to reduce the appearance of fake news (Allcott & Gentzkow, 2017). More recently, IGI Global has released a handbook on fake news. The New York Times and IBM are collaborating on high tech solutions to fight fake news, using blockchain technology (Chiluwa & Samoilenko, 2020).

Clayton et al. (2019) show that tagging headlines as “Rated false” or “Disputed” may provoke more skepticism toward false news, but may also cause distrust of legitimate news. Pennycook, Bear, Collins, & Rand (2017) also show that the “Disputed” labels on Facebook might backfire.

One of the main challenges of the new decade is certainly the fight against deep fakes, which might have dire consequences (The Guardian had a quite shocking piece entitled “You thought fake news was bad? Deep fakes are where truth goes to die”, Schwartz, 2018).

**Politics**

Despite the political pressure, notably in the US and Europe, Facebook doesn’t even fact check political ads, but bans misleading content and ads about the 2020 census (Matyus, 2019). Former vice president of the United States Joe Biden, who is a
candidate for president in the 2020 election says Section 230 should be revoked, meaning online companies could be held legally responsible for misinformation on their platforms (Nicol, 2020). Several countries have passed laws making it illegal to spread “false statements of fact” (Griffiths, 2019; Sasipornkarn, 2019; Jaswal, 2019).

Even if some of these laws and regulations are useful, many people worry that they are Trojan horses for censorship and control of online speech. Deputy Asia director of Human Rights Watch Phil Robertson believes that the threat of fake news has been exaggerated and is used to ban information that government and countries do not want to see on the Internet (Sasipornkarn, 2019). By the way, I found an amazing statement in *The Detroit Free Press* of September 20, 1866: “The French press knows little, and under laws which punish “false news,” and render a journal liable to suppression if it displeases the executive power, is naturally afraid to say what little it knows” (according to Merriam-Webster, 2017). Nothing has changed under the sun…

China's Ren Xianling of the Cyberspace Administration of China proposed a “reward and punish” system to fight fake news (Cadell, 2016). More recently, China has decided to censor fake news generated with AI and bots beginning January 1, 2020 (AFP News, 2019). Ironically, China is also accused of spreading rumors and fake news in Taiwan (Lin, 2018). Singapore passed a law to fight fake news, which, according to companies like Google and Facebook, give the government “too much
power in deciding what qualifies as true or false” (The Guardian, 2019). People need to reflect on how much freedom they want to lose over the fight against fake news. Exposing lies is a necessity, as long as it is not an excuse to censor alternative voices and to silence the opposition. It would considerably damage the little trust people have left in politicians.

Our next section focuses on the issue of trust in science and academic publishing, which is also jeopardized by the flood of fake research and data. Worse, according to Stanford University epidemiologist John Ioannidis, many scientific findings are unreliable or simply wrong and the majority of results are false. Too many publications contain exaggerated claims and inflated results (Moody, 2017).

Lying to expose academic misconduct

A turning point: SCIgen and the birth of computer generated papers

Aguayo, and Maxwell Krohn, the three computer-science graduates at the Massachusetts Institute of Technology (MIT) in Cambridge who wrote in 2005 the infamous SCIgen, a computer program able to generate “academic” papers. According to Conner-Simons (2015), “SCIgen emerged out of Krohn's previous work as co-founder of the online study guide SparkNotes, which included a generator of high-school essays that was based on “context-free grammar.”

Impact and consequences of hoaxes

According to Collins English Dictionary, a hoax is “a deception, esp[ecially] a practical joke” (Collins English Dictionary, 2014). Some hoaxes are pranks and tricks, such as in the cases we discuss in the following section; others are frauds, usually to take money from someone. One of the first famous academic hoaxes was perpetuated in 1996 by Alan Sokal, a professor of mathematics at University College London and a professor of physics at New York University. He was curious to see whether Social Text (Duke University Press), a non-peer-reviewed journal focusing on postmodern cultural studies, would accept his nonsensical article entitled “Transgressing the Boundaries: Toward a Transformative Hermeneutics of Quantum Gravity. Social Text” (Sokal, 1996a). Sokal (1996b) reveals that the paper was a hoax. He notably writes:
“Throughout the article, I employ scientific and mathematical concepts in ways that few scientists or mathematicians could possibly take seriously” (Sokal, 1996b, p. 2) and “What’s more surprising is how readily they accepted my implication that the search for truth in science must be subordinated to a political agenda” (ibid., p. 3). A large number of academic hoaxes have been perpetrated since then (Bohannon’s hoax for example; he published his report in *Science*: Bohannon, 2013); we only discuss two in detail to see their impact and influence. Obviously, academic hoaxes involve submitting false information, fabricating data and nonsensical results; it is wasting editors and reviewers’ time and energy and the authors of these hoaxes might be subject to ethical criticism. My advice, as an editor for many years, is to make sure every submission is read very carefully by 3 to 5 specialists in the field. In my experience, lots of scholars around the world are willing to join editorial teams and help review papers. For example, the *IAFOR Journal of Education* I co-founded and edited for years has now a team of more than 80 scholars.

**Case 1**

In 2005, Stribling, Aguayo, and Krohn submitted an article generated with SCIgen to the World Multiconference on Systemics, Cybernetics and Informatics, or WMSCI. As disturbing as that sounds, the nonsensical paper entitled “Rooter: a
methodology for the typical unification of access points and redundancy” submitted by Jeremy Stribling and co-authored with Daniel Aguayo and Maxwell Krohn, was accepted as a non-reviewed paper (Sample, 2014). The article is still available at this address: https://pdos.csail.mit.edu/archive/scigen/rooter.pdf.

According to the three pranksters on their webpage (https://pdos.csail.mit.edu/archive/scigen), the main objectives of the computer program were to “to maximize amusement” and to expose “bogus conferences”, that is, conferences with very low standards that appear to accept nonsensical articles with obviously no peer-review process. WMSCI organizers learned of the prank and disinvited them, but the three graduate students in the PDOS research group at MIT CSAIL decided to do their talk anyway; after receiving donations, they used the money “to hold our own session at the same hotel as WMSCI 2005” in Orlando, USA. Stribling made a randomly-generated talk called “Synthesizing Checksums and Lambda Calculus using Jog”, and pretended to be a certain Dr. Mark Zarqawi, from the American Freedom University. Daniel Aguayo and Maxwell Krohn also used an alias: Dan was Franz T. Shenkrishnan, Ph.D., Network Analysis Laboratories and Max was Dr. Thaddeus Westerson, Institute for Human Understanding (sic) and presented a randomly-generated talk. They videotaped the three presentations and posted the movies on their site.
According to Ball (2005), WMSCI's general chairman, Nagib Callaos, was based in Venezuela and had no listed academic affiliation. Professor Jeff Erickson, who was an Associate Professor at the University of Illinois at Urbana-Champaign in 2005, defended the three pranksters in his blog and perfectly summed up the main issue: “Callaos seems unaware of the differences between “review” and “sanity check”. It's one thing to accept some submissions without review; it's quite another to accept papers without reading them at all.” He also adds:

The acceptance letters are sent from a Venezuelan email address, but include an office building in Orlando as a return address; the conference website is full of meaningless pseudo-intellectual gibberish; and most tellingly, they send ridiculous amounts of spam to attract submissions. These are not actions of a reputable publisher. (Erickson, 2005)

As a matter of fact, WMSCI is, according to Krohn, a conference known for “being spammy and having loose standards” (Conner-Simons, 2015). Stribling, Aguayo, and Krohn write in the ‘about’ section of their website: “One useful purpose for such a program is to auto-generate submissions to conferences that you suspect might have very low submission standards. A prime example, which you may
recognize from spam in your inbox” (https://pdos.csail.mit.edu/archive/scigen).

Actually, just as I was writing this paragraph, I received several spam emails in my mailbox praising my work and asking me to submit a paper to bogus journals included on Beall’s list (Beall, 2012; Quek & Teo, 2018; Montoneri, 2018). As we all know, these spams always begin with the infamous “I have had an opportunity to read your paper … published in … and believe that you are an expert in this field.” Academic spamming includes “inventive language, flattery, and exuberance” (Grey et al., 2016); it is often sent by bots (“almost 30% of the spam and content spread on the Internet originates from these software bots”, according to Burkhardt, 2017) and usually forgets to tell the author(s) that a publication fee must be paid if the paper is accepted (“less than 25% of e-mails from predatory journals mentioned publication fees”, according to Burggren et al., 2018), that is, almost always, one or two weeks after submission, as long as the author(s) can pay hundreds of US dollars (Fast Company, 2015). “These charges were often told to the authors after the article had been accepted for publication. This is akin to paying a ransom for your article to be known in the academic arena” (Quek & Teo, 2018).

Stribling (2009, p. 8) says:

Nagib Callaos deserves much of the credit for my fifteen minutes of fame, as
do Max and Dan, the SCIgen donors, Dr. Thaddeus Westerson, Dr. Mark Zarqawi, and Franz T. Shenkrishnan, PhD. And those are just the people who influenced my research directly.

I was surprised to find Stribling, Aguayo, & Krohn (2005) on ResearchGate (https://www.researchgate.net/publication/247434752_Rooter_A_Methodology_for_the_Typical_Unification_of_Access_Points_and_Redundancy) when I wrote this chapter. As of January 2020, it had 136 reads, 2 citations and a research interest score of 1.5. One of my concerns is that RG is offering “related research”, that is, genuine academic papers, related to this hoax. The fake paper is also on Academia, which also offers related research (https://www.academia.edu/4880269/Rooter_A_Methodology_for_the_Typical_Unification_of_Access_Points_and_Redundancy). It is not that surprising: McCook (2015) for example showed that “Half of anesthesiology fraudster’s papers continue to be cited years after retractions”. Little progress seems to have been made on this issue. Two decades ago, Pfeifer & Snodgrass (1990) showed that 82 completely retracted articles still got cited 733 times after retraction. Clearly, once a lie or an error has spread, it is difficult to set the record straight as Mark Twain said....

WMSCI started in Baden-Baden, Germany in 1995 and is often held in
Orlando, Florida. Until 2005, WMSCI allowed around 15% of non-reviewed submissions and the three MIT graduate students’ fake research was accepted in this category. Probably because of the scandal caused by the acceptance of the computer-generator nonsensical submission, since 2006, non-reviewed papers are not accepted anymore; moreover, authors have access to the reviews of their accepted papers. To defend themselves after the 2005 scandal, the International Institute of Informatics and Systemics (IIIS), which organized the 2005 WMSCI conference, notably stated in their very lengthy acceptance policy:

This is one of the reasons why, in ICSIT Conferences, we accepted in the past non-reviewed papers taking the intrinsic risks of this kind of paper acceptances. Deception was a risk that was not perceived at the moment of examining the risks of this kind of acceptance policy (International Institute of Informatics and Systemics, 2019).

The first CGP created with SCIgen was clearly a prank submitted to what the three MIT graduates thought was a bogus conference. However, after their fake paper got accepted, the online free program became famous and a lot of “researchers” used it to cheat in order to increase their publication record. After 2005, a fast growing
number of nonsensical CGP got submitted, not because the author(s) wanted to expose flaws in academia and publishing anymore, but because of “the publish or perish paradigm that drives desperate faculty to compromise academic integrity by submitting CGP to journals” (Dunne, 2019). As anybody can generate a paper, pretend to be a scholar and submit gibberish to international conferences and academic journals, a lot of people succumbed to the temptation. The most disturbing fact is that all types of journals got caught into retraction scandals, even the most prestigious. Springer (Germany) and the Institute of Electrical and Electronics Engineers (IEEE) in New York City retracted around 120 conference proceedings in 2014 after Cyril Labbé, a French computer scientist, discovered that the articles were generated with SCIgen (Labbé & Labbé, 2012; Van Noorden, 2014). According to McCook (2018), the Retraction Watch database records that around 40% of the retractions originate from conference abstracts submitted to IEEE. The spike in retractions is between 2009 and 2011. In total, more than 7300 abstracts got quietly removed, most of them submitted from China. Reasons for retractions are vague. However, Brainard and You (2018) provide more precise information and data on the main reasons for retraction: first, they noted that the blog Retraction Watch included 18,000 retracted papers and conference abstracts, from the 1970s to 2018; the withdrawal is often due to honest error, not always to deliberate fraud. However,
Science and Retraction Watch analyzed about 10,500 retracted journal articles and found out that “much of the rise appears to reflect improved oversight at a growing number of journals” and that “the majority of retractions have involved scientific fraud (fabrication, falsification, and plagiarism) or other kinds of misconduct (such as fake peer review)” (Brainard & You, 2018). According to McCook (2017), Springer retracted 64 papers from 10 journals in 2015 and 107 in 2017 over fake peer reviews.

Case 2

The grievance studies affair, or Sokal Squared scandal (named after Alan Sokal’s 1996 hoax in Social Text), started in 2017. The hoax was elaborated by Peter Boghossian (assistant professor of philosophy, Portland State University), James Lindsay (writer), and Helen Pluckrose, (writer and editor of Areo online magazine). The trio submitted 20 nonsensical papers to academic journals in the field of postmodernism. Cogent Social Sciences (affiliated with Taylor & Francis) accepted to publish one of their articles entitled “The conceptual penis as a social construct” (which contains sentences such as “the conceptual penis is better understood not as an anatomical organ but as a social construct isomorphic to performative toxic masculinity”; Lindsay & Boyle, 2017). James A. Lindsay and Peter Boghossian immediately revealed it was a hoax to discredit gender studies (Jaschik, 2017). It
should be noted that one of the editors of *NORMA: International Journal for Masculinity Studies* immediately rejected the submission, adding: “we thought it was sheer nonsense” (Jaschik, 2017).

The paper got of course taken down; it is archived on Wayback Machine (Lindsay and Boyle, 2017). As Peter Boghossian is a university professor, the Oregon university’s institutional review board started disciplinary proceedings in 2018 against him for violation of Portland State’s ethical guidelines. Some criticized the papers because they seem “to humble entire fields while the authors gin up publicity for themselves without having made any scholarly contributions whatsoever” (Mangan, 2019). But around 100 scholars defended Boghossian, including Steven Pinker, a professor of psychology at Harvard University, and the famous Alan Sokal himself, now at University College London. As to February 2020, he is still an Assistant Professor at Portland State University.

I like what James Lindsay wrote about the hoax: “We hope the increased attention on gender scholarship either vindicates the field, if it has no problems, or initiates the housecleaning it needs, if it does” (Jaschik, 2017), it sounds like “he himself considered the destruction of beliefs that could not stand up to criticism as a necessary preliminary to the search for true knowledge” I mentioned earlier (Encyclopædia Britannica, 2009). Interestingly, one of Boghossian’s areas of expertise
is the Socratic method that encourages critical thinking.

McBain (2018) notes that journalists were the first to grow suspicious of the papers published by the trio; the media attention made them cut their hoax short. As journalists regularly relay scientific discoveries in their newspaper, they can also help to check the validity and reliability of the publications they read. McBain considers that the pranksters wanted to expose the partisan and intolerance of some journals and campuses in the US. Academic hoaxes are a test, not only for scholars and publishers, but also for journalists and newspapers. However, a more positive approach would probably have a better impact, that is, exposing the papers already published that contain nonsense and false claims, instead of adding more nonsensical papers. At least, the authors would have real publications and more recognition from the scientific community.

Below is Table 9.1 I designed with some advice and solutions already implemented to fight fake news and fake research. Obviously, it is not an exhaustive list.

Table 9.1: Advice and solutions to fight fake news and fake research

<table>
<thead>
<tr>
<th>Solutions</th>
<th>Fake news</th>
<th>Fake research</th>
</tr>
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<tbody>
<tr>
<td>Sanity check</td>
<td>“For the modern newspaper reader, reading the headline of a news item replaces the reading of the whole story” (Luu, 2019).</td>
<td>Erickson (2005): “It’s one thing to accept some submissions without review; it’s quite another to accept papers without reading them at all.” The editor and at least two reviewers.</td>
</tr>
<tr>
<td>Gabielkov et al. (2016): 59% of people who share news URLs on Twitter don’t read</td>
<td></td>
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| Education | Jones-Jang, Mortensen, & Liu (2019): “information literacy […] was positively associated with fake news identification.”
In many countries now, schoolchildren learn how to spot fake news (BBC, 2019; Smith, 2017; Mackintosh, 2018). |
| Technology | Using machine algorithms, AI (Fabula AI, Good News), and blockchain to detect and contain fake news (Waugh, 2019: MIT study of 2018 found that AI 65% effective in detecting fake news). Online fact checkers: Politifact, Snopes, Fact Checker, Full Fact… The New York Times and IBM are collaborating on high tech solutions to fight fake news, using blockchain technology (Chiluwa & Samoilenko, 2020). |
| Laws, regulations | Facebook doesn’t even fact check political ads, but bans misleading content and ads about the 2020 census (Matyus, 2019). Joe Biden says Section 230 should be revoked, meaning online companies could be held legally responsible for misinformation on their platforms (Nicol, 2020). China’s Ren Xianling of the Cyberspace Administration of China for a “reward and punish” system to fight fake news (Cadell, 2016).
Several countries passed laws making it illegal to spread “false statements of fact” (Griffiths, 2019; Sasipornkarn, 2019; Jaswal, 2019). |

(specialists in the field) should carefully read the entire submission (Council of Science Editors, 2012).

“Rebutting bad science may not be effective, but asserting the true facts of good science is” (Gawande, 2016). Lazer et al. (2017): “Make the truth louder.”

Automated plagiarism detection tools such as iThenticate, Turnitin, are useful, but results of the evaluation should be checked by human reviewers.

Lavoie & Krishnamoorthy (2010) were able to identify Scigen papers using Algorithmic Detection. Also on Scigen detection: Labbé, Labbé, & Portet (2013); Nguyen (2018). Academic misconduct is punished by universities and by journals. In China: after Springer in 2017 retracted 107 papers by Chinese authors, Beijing vowed to severely punish (deprived of funding, sacked, publicly shamed) the offenders for damaging the reputation of the country (Chen, 2017). Oransky (2014) discusses the case of the scandal involving Taiwan’s Education Minister Chiang Wei-ling, who got forced to resign (peer review ring).

The Committee on Publication Ethics (COPE), founded in 1997, provides guidelines on the ethics of scholarly publishing (COPE, 1999).

Conclusion
Oxford Dictionaries’ statement from 2016 that “truth itself has become irrelevant” is shocking and worrisome. Fake news, fake data and fake research clearly undermine the idea of truth and the trust of the people in the media and the scientific community. On the bright side, things are moving fast and a lot of reliable research and studies have been published on these issues and this is an opportunity, notably for the younger generation to be better prepared by learning logic, reason, and critical thinking.

It’s true that social media and the ubiquity of digital platforms have made spreading false or biased information easier. But the core issue isn’t just technology—and neither can it be solved with better fake-news filters or algorithms (Timsit, 2019).

The creation and spread of fake news is a human problem. We can of course use bots and software, and make laws, but we obviously need to educate people to learn “the skills to absorb, assess, and sort the unprecedented amounts of information coming from new technologies” (Timsit, 2019). The same is true with the issues of fake publications (including computer generated papers, fake peer-review, identity
theft, fake or doctored data, and so on) and plagiarism. Journalists and scholars must set the example and share unbiased and truthful information and knowledge.

Since 1947, the Bulletin of the Atomic Scientists maintains the Doomsday Clock, a symbol representing the risk of humanity destroying itself, because of man-made global catastrophes and unchecked scientific and technical advances. At the time, the main threat was nuclear war. On January 23, 2020, the clock got the closest ever to midnight:

Information warfare and a looming space arms race are among the emerging threats that led a group of scientists today to reset their iconic Doomsday Clock to 100 seconds to midnight […] Other risks feeding the new Doomsday Clock setting were the dissemination of fake news online, unregulated genetic engineering, and hypersonic weapons developed by Russia and the United States (Ortega, 2020).

My three major concerns over the dissemination of fake news and the spread of fake research are the potential to affect election results (Allcott & Gentzkow, 2017), the risk of war based on misleading information (Goldman, 2016) and the spread of useless or false results in the field of medicine, especially with the risk of a global
epidemic (Molteni, 2020). As we can already see on the news, fake news and misinformation about the Wuhan virus is spreading fast and fueling racism and xenophobia around the world. “Discrimination is not acceptable. It is not helpful and spreading misinformation does not offer anyone protection”, said Dr. Eileen de Villa, Medical Officer of Health, Toronto Public Health, at the end of January 2020. She added, “I want to remind people to check credible, evidence-based sources to get the facts when seeking information” (Sutton, 2020). Governments, however, need to pay more attention to privacy and liberty concerns. Censoring information and randomly branding anything fake news can be dangerous and counterproductive; for example, many begin to criticize China for turning against people who tried to warn the media and the politicians of the threat of the coronavirus: “Politicians downplayed the severity of the virus, while police went after ‘rumormongers’ and censors deleted any commentary that questioned the official line” (Griffiths, 2020). Labeling information ‘fake news’ should not be a weapon to silence voices and create an atmosphere of ‘white terror’. And going after whistleblowers who tell the truth and want to prevent catastrophes (‘rumormongers’ were in fact “medical workers trying to warn people of the potential dangers of the new virus”, Griffiths, 2020) shows that we have made little progress since the time of Socrates after all.

I wanted to finish this chapter on a more positive note, so here it is: The
National Science Foundation's Daniel K. Inouye Solar Telescope (Hawaii) released a close-up high resolution view of the sun’s surface (National Science Foundation, 2020). These images give us the opportunity to gaze at the sun (including a picture taken at 789 nanometers), a star which has been active for about 5 billion years and that many civilizations worshiped as a god. Today is Sunday February 02, 2020 and this is the end of my chapter.

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