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Seminar: How do I lie with statistics?

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Intersubjectivity - The Limits of Knowledge and the Power of Bullshit

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1. Introduction

Lying is prevalent in our everyday life. Deception and dishonesty are believed to be part of what makes us human and indeed lying might have given Homo sapiens an evolutionary advantage. We have learnt from this Seminar how people could lie with charts, graphs and data, by means of misusing statistics or applying distortion to visual displays. We can also be easily manipulated by fallacious reasoning and draw biased inferences. While it is imperative to recognize these “how to lie” mechanisms, it is equally crucial to understand the “why we lie” aspects, i.e. the fundamental drivers behind the lying epidemic. Especially in the current era of post-truth politics¹, where we are bombarded with misinformation and fake news, it is vitally important to distinguish fact from fiction, reality from opinion, and truth from falsehood.

The aim of this paper is to examine the questions “why is lying so common” and “why do humans so readily believe in lies” from a multi-lensed perspective of anthropology, psychology, neuroscience and evolutionary biology. In addition to establishing a differentiation between “truth” and “falsehood” by their relations to “reality”, this paper presents a concept of “intersubjective reality” from the book “Sapiens: A Brief History of Humankind” by Yuval Noah Harari. Intersubjective realities exist only in the human mind and are given force through collective belief. They are created to ensure large-scale, flexible cooperation between many individuals. The unique ability to believe in these intersubjective constructs separates humans from other species.

A summary of Harari’s book is presented in Section 2 with key takeaways which are particularly relevant to this paper’s topic. It is followed by a detailed discussion of the concept of “intersubjective reality” in Section 3, with examples to illustrate how powerful these fictional entities are at uniting human species at the collective level, and the implications of placing blind trust in them. Section 4 explains humans’ propensity towards deception as well as their susceptibility to believing in lies, using supplementary evidence from research and studies in psychology and neuroscience. Finally, we conclude in Section 5 that it is dangerous to non-discriminatingly accept intersubjective reality as objective reality; we also appeal for greater awareness of our own limitations in recognition of these falsehoods.

¹ Post-truth politics is the Word of the Year for 2016 by the Oxford Dictionary where it is defined as "Relating to or denoting circumstances in which objective facts are less influential in shaping public opinion than appeals to emotion and personal belief"

2. Book Summary & Reception

“Sapiens: A Brief History of Humankind” is a book written by Yuval Noah Harari, a history professor at the Hebrew University of Jerusalem. It was first published in Hebrew in Israel in 2011 and in English in 2014. The book describes the history of Homo sapiens from prehistoric times to the present day twenty-first century. While the book has been an international bestseller and it has received a lot of accolades from the general public, it is worthwhile to note that the book’s reception has been mixed² among scholars with relevant subject matter expertise.

2.1 Key Takeaways

Throughout this book, Harari attempts to answer the key questions: “How did Homo sapiens succeed in the battle of dominance on Earth? Why did our foraging ancestors come together to create cities and kingdoms? How did we come to believe in gods, nations and human rights?” He begins with a humbling reminder that “the most important thing to know about prehistorical humans is that they were insignificant animals lying somewhere in the middle of the food chain, with no more impact on their environment than fireflies, jelly fish or woodpeckers”. Harari traces the history of Sapiens from the Stone Age to the present day in four parts:

Part One introduces the Cognitive Revolution, which took place some 70,000 years ago when Sapiens evolved imagination and spoken language. Although it is still unknown what triggered the Homo sapiens’ brains to develop, Harari believes it was Homo sapiens’ unique cognitive abilities that gave them an advantage over other human species. Homo sapiens is primarily a social animal and our language evolved as a way of gossiping. However, what is truly special about our language is its ability to transmit information about things that do not exist at all. In contrast, other animals can only communicate about objective realities, i.e. things that do exist. Consequently, imagination, abstract thinking and language capabilities enabled Homo sapiens to create fictions and imagined realities. By believing in the common myths and so-called “intersubjective realities”, large numbers of strangers can establish trust

² Anthropologist Christopher Robert Hallpike reviewed the book and did not find any "serious contribution to knowledge". Reviewing the book in The Guardian, philosopher Galen Strawson concluded that among several other problems, "Much of Sapiens is extremely interesting, and it is often well expressed. As one reads on, however, the attractive features of the book are overwhelmed by carelessness, exaggeration and sensationalism." Evolutionary anthropologist Avi Tuschman, pointing out the contradiction between Harari's "freethinking scientific mind" and his "fuzzier worldview hobbled by political correctness", nonetheless recommended that "Harari's book is important reading for serious-minded, self-reflective sapiens."

with each other, follow the same set of rules and therefore cooperate successfully together. This kind of social cooperation, both flexibly and in large scale, differentiates Homo sapiens from other animals and explains the rise of Homo sapiens to the top of the food chain.

Part Two of the book describes the Agricultural Revolution which occurred around 12 thousand years ago. It is characterized by the domestication of plants and animals by humans around the world, or rather, as Harari would argue, it was plants and animals that domesticated humans. This period also marks a transition from a hunter-gatherer nomad lifestyle into cultivation-based permanent settlements, leading to huge population growth and much individual suffering. In order to cope with the increasingly complex social order, written scripts were used as tools for storing and processing data to overcome limitations of our biological brains. Harari presents the first evidence of writing as a method for storing information by the ancient Sumerians; it was a record of tax payment in the form of partial script. In addition, Harari also gives a brief account of the history of the Arabic numerical, critical for the development of modern mathematics, which is arguably the world's most dominant language used today.

Part Three, the Unification of Humankind, portrays the gradual consolidation of human organisations from small settlements into kingdoms, dynasties, and empires. Harari attributes three key universal orders as the key drivers of the unification process, namely, the monetary order, the imperial order and the order of universal religions such as Buddhism, Christianity and Islam. He further explains that money, religion and human political organisations are all intersubjective constructs and illustrates the power of these shared beliefs in governing the human race to behave as a single unit. Moreover, it is also interesting to note how the basic forms of statistics³ first emerged as a bureaucratic tool to help empires store and process the so-called "empire-sized data". The Han Dynasty and the Roman Empire are some of the first entities that extensively gathered data on the size of their population, geographical area and wealth, for taxation purposes and military use.

Part Four of the book discusses the Scientific Revolution and its implications over time. Objective science emerged about 500 years ago and is based on the Latin concept "*ignoramus*" ('we do not know'). It assumes that we don't know everything and it accepts that the things that we think we do know could be proven wrong as we gain more knowledge. This approach promotes critical thinking and evidence-based discovery. New knowledge is

³ The term "Statistic" was formally introduced by Gottfried Achenwall in 1749, signifying the "science of state".

gained by gathering observations and applying mathematical tools to form comprehensive theories. The rise of capitalism empowered the Industrial Revolution ca. 200 years ago and resulted in an explosion in human productivity and scientific discoveries by harnessing new sources of power and technological advancements. Harari thinks Homo sapiens, with their unprecedented powers, are beginning to break the laws of natural selection and biologically-determined limits and transcend into the so-called Homo Deus.

Harari's book covers an extensive range of interesting topics such as human suffering, happiness, gender inequality, liberalism, ecological degradation, etc. It is beyond the scope of this summary to comprehensively capture them all. Instead, the next section of the paper will focus on the concept of "intersubjective reality".

Section 3. Intersubjective Reality

3.1 Truth, Falsehood and Reality

In order to understand why people lie, it is imperative to first differentiate between what is false and what is true. This is a longstanding debate. Aristotle defines it as: "To say of what is that it is not, or of what is not that it is, is false, while to say of what is that it is, and of what is not that it is not, is true." (Metaphysics). This paper is not intended to cover the entire corpus of philosophical theories regarding "truth" and "falsehood"; it considers "truth" simply as a functional approximation of reality. This definition of truth stems from the survival imperative of grasping one's environment physically and intellectually (Fromm, 1968); the accuracy of such perceived approximation has direct consequences on one's ability to deal with one's environment. This then leads naturally to the next question: what is reality?

The philosophical and intellectual quest for "reality", like the debate of "truth", is also centuries old, and is considered inconclusive and incomplete at best. According to Harari, there are three-layers of reality: objective reality, subjective reality and intersubjective reality. Objective reality consists of things that exist in the physical world (e.g. trees, lions, gravity, radioactivity, etc.); they exist independent of people's beliefs and feelings. Subjective reality, on the other hand, is dependent on the personal beliefs and feelings of individuals (e.g. pain, fear, desire, imaginary friends, etc.), which exist solely by means of an individual's subjective awareness of them.

There's one more layer of reality that is often discounted. This is what Harari calls "intersubjective reality". It consists of imaginary entities that exist only within the communication network linking the subjective consciousness of many individuals. Money, gods, laws, nations and corporations are some examples of intersubjective reality. These entities are constructed by humans' imagination and provide a web of meaning to the order that binds together the groups of people who share the common belief in them. Sometimes the intersubjective entities also have a physical form, hence people might mistake them as objective reality. However, clear distinctions must be drawn between them.

3.2 Examples of Intersubjective Reality

Harari uses money as an example to illustrate that intersubjective entities have no intrinsic value attached to them, besides the value that people have agreed to place on them. Money is not just the objective reality of a piece of coloured paper (or increasingly as electronic data), but rather, a banknote has monetary worth because people have collectively determined that it has value. Money was invented as a medium for exchange and storage for wealth. Money might have assumed many different objective forms, such as seashells, silver, gold, banknotes, Bitcoins, etc. throughout the passage of time, but they all share an important feature: universal convertibility. With that, money builds universal trust between complete strangers and facilitates effective cooperation on a large scale in human societies. Nevertheless, it is essentially a fictional construct of the human mind. Money has value only in people's shared beliefs and the value of money evaporates the minute people stop believing. Take the instances of the Russian rouble crash in early 1990, the Icelandic krona collapse in 2008 and the more recent Venezuela and Turkey currency crises in 2016 for example.

Harari uses another example of Peugeot, a limited liability corporation, to illustrate that companies and corporations are also intersubjective realities in nature. He first asked the question what Peugeot is exactly and explains what Peugeot is not: it is not just the brand, the products, the factories and buildings, the employees, the management or the shareholders. What makes Peugeot Peugeot is everyone's agreement that Peugeot exists, duly noted in some legal documents. Harari then compares the creation of a company in modern society with how ancient priests and sorcerers created gods and demons. These corporations are technically known as "legal fictions" in the eyes of the law. They are stories invented and maintained by lawyers, or what Harari calls "the powerful wizards". Arguably amongst the most influential and powerful players in today's global economy, corporations such as Google, Apple, Coca Cola, Starbucks, BMW, SAP, etc., are all intersubjective

entities. People have grown so used to them that they are sometimes taken for granted as objective realities, but it is important not to forget that they are also constructed entities that exist in the shared imagination of people who believe in them.

3.3 Empowerment at the Collective Level

Intersubjective realities play a key role in uniting people to cooperate with each other to achieve a collective goal. Harari argues that Homo sapiens is the only species that can cooperate both flexibly and on a large scale. He believes this is the secret of our species' success. Other species, such as social insects, can operate in large numbers but their mode of cooperation is rigid because it is genetically encoded and takes time to evolve and adapt to changes. As for social mammals, they can cooperate flexibly, but only do so with intimate knowledge of one another; therefore, their cooperation is limited by the size of the social group. According to British Anthropologist Robin Dunbar, due to cognitive limit, there is a correlation between brain size and social group size; for chimpanzees, the number is 50, and for Homo sapiens it is 150. This rule of 150 applies equally to the early hunter-gather societies as it does today. It dictates the number of individuals with whom any one person can maintain stable relationships. However, humans have been organising themselves for centuries in mass-cooperation networks, based on collaborations involving numbers of people far beyond 150. This is because we can create fictions and imagined orders at a collective level. As long as everyone believes in the same fictions and orders, everybody can obey the same rules, follow the same norms, and share the same values. Consequently, this enables large scale collaboration and the emergence of more complex social structures.

3.4 Impermanence and Implications

Another characteristic of intersubjective reality is its impermanence and fragile nature. An intersubjective entity can cease to exist when most individuals in the network change their beliefs, since intersubjective reality has no inherent value and objective basis. Ideologies and religions fade out and vanish completely when nobody believes in them anymore. Likewise, nations and super-nations could fall and disappear, or they may reorganize and mutate into a new and different form (for example, imagine the European Union post Brexit). Another prime example of the impermanent nature of intersubjective reality is the demonetisation of the Indian 500- and 1000-rupee banknotes in 2016. Money can be annihilated and removed from the system when the issuing government, another fictional entity, tells people to stop believing in it. The same thing could happen to any intersubjective

constructs therefore it is important not to take them for granted the same way as the objective reality.

We need to recognize how the intersubjective realities are created and be aware when new intersubjective entities come into existence. As previously established at the beginning of this section, truth is an approximation of reality and lies can alter the accuracy of this perception. Imagined constructs based on falsehood, once shared and believed by many individuals, could become an intersubjective reality. These fictional entities are powerful, not only because they could potentially evoke mass-scale actions at a collective level, but also because of the false trust we place in them. These entities and the decisions they make would further impact the objective reality and ultimately alter our very own existence.

4. Why Do We Lie and Why Do We Believe in Lies?

4.1 The Evolutionary Value of Lying

Lying has come to be recognized as a deeply ingrained human trait and being deceitful is woven into our very fabric and everyday life. Today, lying is so prevalent that studies show that on average an individual lies 0.59 - 1.56 times⁴ per day (Vasconcellos, et al. 2019). Deception is not only commonplace in human societies but also present in animal kingdoms. Researchers have long known that the more intelligent the species and the larger the neocortex, the more likely it is to be deceptive (Byrne & Corp, 2004). The ability to manipulate others without using physical force conserves energy and likely confers an advantage in the competition for resources and mates. Lying, therefore, has evolutionary value to humans as a species.

Lying is deeply rooted in our language system. Some evolutionary linguists even go so far as to assert that human language evolved primarily as a method for manipulation and deception (Scott-Phillips, 2006). Dor (2017) argues that the emergence of language did more to enhance the human capacity for deception than it did for honest communication. He perceives language as a tool collectively designed for the instruction of imagination (Dor, 2015) and storytelling allows the replacement of actual experience in real life with the

⁴ A range for the average number of lies that individuals in civilized societies utter daily is presented here. Different studies reveal distinct results due to the difference in characterization of the sample and the criteria adopted. In most cases, the samples include both university students and the population in general, and both pro- and anti-social lies are counted.

imagined experience constructed by language, leaving room for lies and deception. Closely entangled, lying and language have co-evolved in shaping our imagination, cognition, and social interaction.

Indeed, if it weren't for lying, some of the unique characteristics of individual human cognition would never evolve the way they are today. One of the key milestones in child development is the ability to theorise about other minds (Dunbar, 1992). This so-called "theory of mind" is an essential condition for planning and executing a lie: I know that you don't know what I know, therefore I can lie to you. Moreover, the brain's executive functions also play a critical role. To lie convincingly requires the ability to control speech, facial expression and body language, as well as to think abstractly and plan strategically. These cognitive abilities are crucial aspects required for successful social interaction and vital skills for survival in the evolutionary process for Homo sapiens.

4.2 Good at Lying, Terrible at Detecting Lies

Ironically, humans' capacity for dishonesty is as fundamental as their need to trust each other, which makes people terrible at detecting lies. Studies have shown that the accuracy of discriminating lies from truth by laypeople "is only slightly better than flipping a coin" (Hauch, et al. 2016). Bond and DePaulo (2006) synthesized the results from 206 documents and 24,483 judges and found that people achieve an average of 54% accuracy in lie-truth discrimination, correctly classifying 47% of lies as deceptive, and 61% of truths as non-deceptive.

Why are humans so gullible? According to the truth default theory (Levine, 2014), people presume others to be honest and are therefore not expecting lies by default. This is because much of the knowledge we use to navigate the world comes from what others have told us; without the implicit trust that we place in human communication, we would not be able to establish social relationships (Ariely, 2012). As the long-term benefit of believing outweighs the cost of being occasionally deceived, lying has been tolerated and the liar's advantage is able to persist in our society.

Our susceptibility to believe lies is also rooted in our cognitive biases and fallacious reasoning. We tend to accept information as true if the new information is consistent with our pre-existing beliefs. This is known as confirmation bias (Plous, 1993). In addition, we have the "tendency to find arguments in favour of conclusions we want to believe to be stronger

than arguments for conclusions we do not want to believe” (Kunda, 1990). Due to this motivated reasoning, we may cling to false beliefs even in the presence of clear contradicting evidence. Furthermore, when peoples’ beliefs in false information is being countered with scientific fact-checking, a backfire effect might be triggered where people not only fail to change their minds, but instead become even more committed to the false information (Nyhan & Reifler, 2010). We are terrible at detecting lies, because most of the time we just want to believe what we are hearing, especially when the lies affirm our views.

4.3 Limitations of the Human Brain

According to evolutionary psychology, our brains are evolved organs that are susceptible, as all organs are, to the pressures of natural selection. Harari points out a few limitations of human brains, one of which is that they have adapted to store and process only particular types of information, namely, botanical, zoological, topographical and social information. Faced with large amounts of data, our brains are often overwhelmed. Therefore, we evolved to rely on cognitive shortcuts, such as confirmation bias and availability heuristics, as coping mechanisms to make rapid decisions while reducing the cognitive load, especially when facing conflicting beliefs. This is known as the theory of cognitive dissonance, developed by social psychologist Leon Festinger in the 1950s.

In the book “Thinking, Fast and Slow”, Kahneman (2011) introduces two modes of thought process to explain some of these mental shortcuts: System 1 is a remnant from the past and has been crucial to our survival for millions of years; it is fast, instinctive and emotional. System 2, on the other hand, is slow, more deliberate and more logical; it is also one of the most recent additions to the human brain, so it has not been subjected to the same set of evolutionary selection pressures. The law of least effort states that the brain uses the minimal amount of energy for each task it can get away with. So System 1 “creates a coherent pattern of activated ideals in associative memory”, so that we jump quickly to idealized conclusions. It also links a sense of cognitive ease to illustrations of truth, pleasant feelings and reduced vigilance. In addition, system 1 is not capable of experiencing doubt.

Recognizing the limitations of our brains, we need to be aware of our own cognitive inclination towards certain fallacies when processing information. As a consequence of our species’ evolution, the default is to believe and make mental short-cuts; disbelief, scepticism, and critical thinking are not natural. Therefore, we need to maintain vigilance and battle our own cognitive biases to avoid being deceived.

5. Conclusion

Since the emergence of language and imagination in the Cognitive Revolution, humans have told stories to give meaning to their life as well as to help them understand their environment. Fictional entities and imagined constructs such as money, religion, laws, countries, and corporations, have been created to enable large scale, flexible cooperation between different individuals and groups. Humanity is separated from other animals by our ability to create these intersubjective entities and believe in them. These fictional constructs then exert force in the real world through the collective actions of its believers thus creating new realities.

With the explosion of information and our brains' inadequacies in dealing with large amounts of data, we invented written scripts, mathematical notations, statistics and computer programs to help us store, process and interpret information. However, our brain still prefers stories and visual perception. In the long history of human evolution, critical thinking has not been part of the selection criteria, so it hasn't been well developed.

Falsehoods such as the denial of climate change, belief in conspiracy theories, spread of alternative truth, misinformation, fake news, etc. have thrived on the internet and the mainstream media because of this vulnerability. Our limited ability to discriminate between truth and mistruths endangers our society, as the intersubjective reality of these deceptions may eventually negatively influence our future objective reality. Therefore, we must always strive to overcome our inherent biases and endeavour to pursue the objective truth.

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