

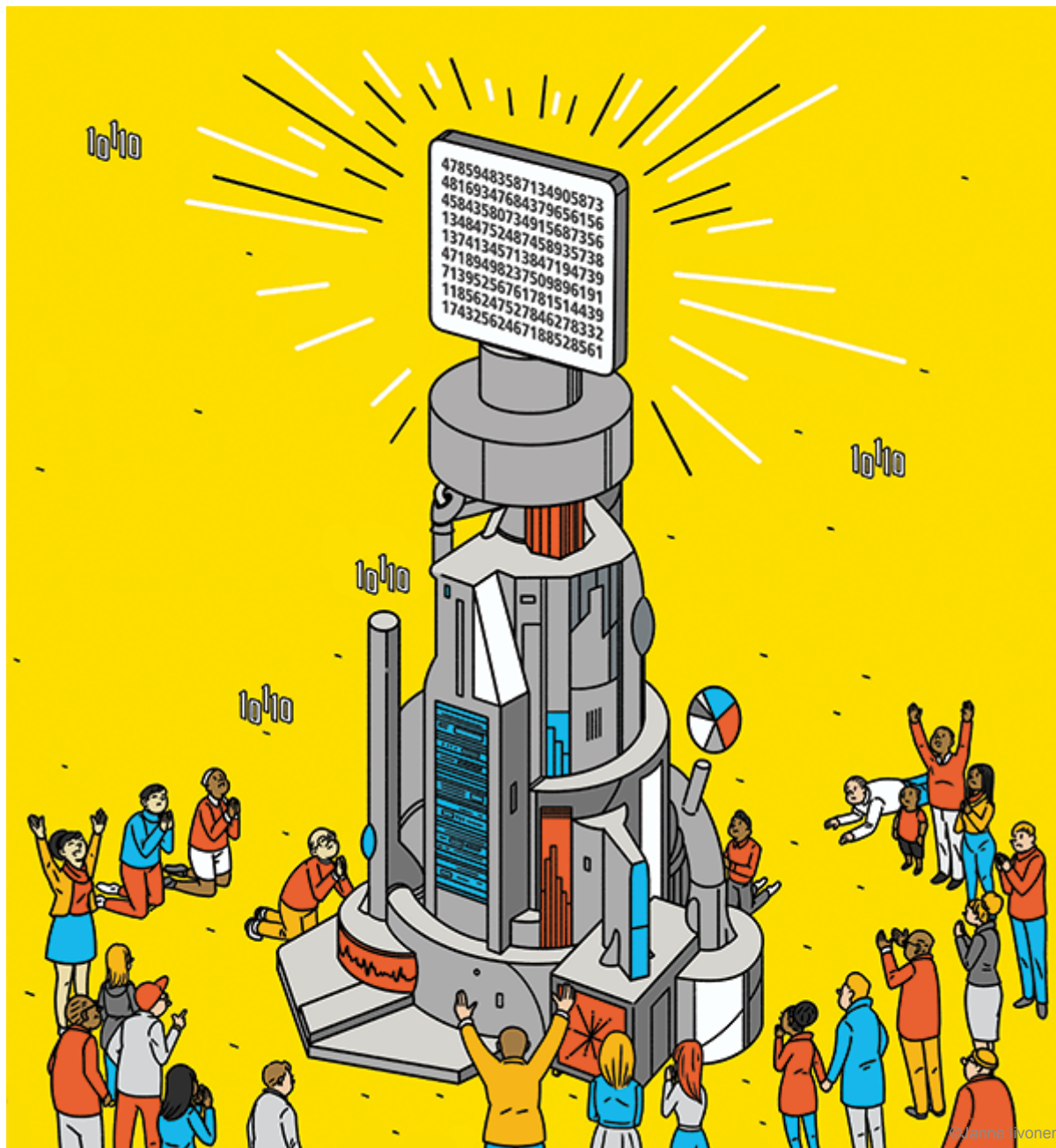
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# Big data, Google and the end of free will

Yuval Noah Harari

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Forget about listening to ourselves. In the age of data, algorithms have the answer, writes the historian Yuval Noah Harari



For thousands of years humans believed that authority came from the gods. Then, during the modern era, humanism gradually shifted authority from deities to people. Jean-Jacques Rousseau

summed up this revolution in *Emile*, his 1762 treatise on education. When looking for the rules of conduct in life, Rousseau found them “in the depths of my heart, traced by nature in characters which nothing can efface. I need only consult myself with regard to what I wish to do; what I feel to be good is good, what I feel to be bad is bad.” Humanist thinkers such as Rousseau convinced us that our own feelings and desires were the ultimate source of meaning, and that our free will was, therefore, the highest authority of all.

Now, a fresh shift is taking place. Just as divine authority was legitimised by religious mythologies, and human authority was legitimised by humanist ideologies, so high-tech gurus and Silicon Valley prophets are creating a new universal narrative that legitimises the authority of algorithms and Big Data. This novel creed may be called “Dataism”. In its extreme form, proponents of the Dataist worldview perceive the entire universe as a flow of data, see organisms as little more than biochemical algorithms and believe that humanity’s cosmic vocation is to create an all-encompassing data-processing system — and then merge into it.



We are already becoming tiny chips inside a giant system that nobody really understands. Every day I absorb countless data bits through emails, phone calls and articles; process the data; and transmit back new bits through more emails, phone calls and articles. I don’t really know where I fit into the great scheme of things, and how my bits of data connect with the bits produced by billions of other humans and computers. I don’t have time to find out, because I am too busy answering emails. This relentless dataflow sparks new inventions and disruptions that nobody plans, controls or comprehends.

But no one needs to understand. All you need to do is answer your emails faster. Just as free-market capitalists believe in the invisible hand of the market, so Dataists believe in the invisible hand of the dataflow. As the global data-processing system becomes all-knowing and all-powerful, so connecting to the system becomes the source of all meaning. The new motto says: “If you experience something — record it. If you record something — upload it. If you upload something — share it.”

Dataists further believe that given enough biometric data and computing power, this all-encompassing system could understand humans much better than we understand ourselves. Once that happens, humans will lose their authority, and humanist practices such as democratic elections will become as obsolete as rain dances and flint knives.

When Michael Gove announced his shortlived candidacy to become Britain’s prime minister in the wake of June’s Brexit vote, he explained: “In every step in my political life I have asked myself one question, ‘What is the right thing to do? What does your heart tell you?’” That’s why, according to Gove, he had fought so hard for Brexit, and that’s why he felt compelled to backstab his erstwhile ally Boris Johnson and bid for the alpha-dog position himself — because his heart told him to do it.

Gove is not alone in listening to his heart in critical moments. For the past few centuries humanism has seen the human heart as the supreme source of authority not merely in politics but in every other field of activity. From infancy we are bombarded with a barrage of humanist slogans

counselling us: “Listen to yourself, be true to yourself, trust yourself, follow your heart, do what feels good.”



In politics, we believe that authority depends on the free choices of ordinary voters. In market economics, we maintain that the customer is always right. Humanist art thinks that beauty is in the eye of the beholder; humanist education teaches us to think for ourselves; and humanist ethics advise us that if it feels good, we should go ahead and do it.

Of course, humanist ethics often run into difficulties in situations when something that makes *me* feel good makes *you* feel bad. For example, every year for the past decade the Israeli LGBT community has held a gay parade in the streets of Jerusalem. It is a unique day of harmony in this conflict-riven city, because it is the one occasion when religious Jews, Muslims and Christians suddenly find a common cause — they all fume in accord against the gay parade. What’s really interesting, though, is the argument the religious fanatics use. They don’t say: “You shouldn’t hold a gay parade because God forbids homosexuality.” Rather, they explain to every available microphone and TV camera that “seeing a gay parade passing through the holy city of Jerusalem hurts our feelings. Just as gay people want us to respect their feelings, they should respect ours.” It doesn’t matter what you think about this particular conundrum; it is far more important to understand that in a humanist society, ethical and political debates are conducted in the name of conflicting human feelings, rather than in the name of divine commandments.

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Yet humanism is now facing an existential challenge and the idea of “free will” is under threat. Scientific insights into the way our brains and bodies work suggest that our feelings are not some uniquely human spiritual quality. Rather, they are biochemical mechanisms that all mammals and birds use in order to make decisions by quickly calculating probabilities of survival and reproduction.

Contrary to popular opinion, feelings aren’t the opposite of rationality; they are evolutionary rationality made flesh. When a baboon, giraffe or human sees a lion, fear

arises because a biochemical algorithm calculates the relevant data and concludes that the probability of death is high. Similarly, feelings of sexual attraction arise when other biochemical algorithms calculate that a nearby individual offers a high probability for successful mating. These biochemical algorithms have evolved and improved through millions of years of evolution. If the feelings of some ancient ancestor made a mistake, the genes shaping these feelings did not pass on to the next generation.

Even though humanists were wrong to think that our feelings reflected some mysterious “free will”, up until now humanism still made very good practical sense. For although there was nothing magical about our feelings, they were nevertheless the best method in the universe for making decisions — and no outside system could hope to understand my feelings better than me. Even if the Catholic Church or the Soviet KGB spied on me every minute of every day, they lacked the biological knowledge and the computing power necessary to calculate the biochemical processes shaping my desires and choices. Hence, humanism was correct in telling people to follow their own heart. If you had to choose between listening to the Bible and listening to your feelings, it was much better to listen to your feelings. The Bible represented the opinions and biases of a few priests in ancient Jerusalem. Your feelings, in contrast, represented the accumulated wisdom of millions of years of evolution that have passed the most rigorous quality-control tests of natural selection.





However, as the Church and the KGB give way to Google and Facebook, humanism loses its practical advantages. For we are now at the confluence of two scientific tidal waves. On the one hand, biologists are deciphering the mysteries of the human body and, in particular, of the brain and of human feelings. At the same time, computer scientists are giving us unprecedented data-processing power. When you put the two together, you get external systems that can monitor and understand my feelings much better than I can. Once Big Data systems know me better than I know myself, authority will shift from humans to algorithms. Big Data could then empower Big Brother.

This has already happened in the field of medicine. The most important medical decisions in your life are increasingly based not on your feelings of illness or wellness, or even on the informed predictions of your doctor — but on the calculations of computers who know you better than you know yourself. A recent example of this process is the case of the actress Angelina Jolie. In 2013, Jolie took a genetic test that proved she was carrying a dangerous mutation of the BRCA1 gene. According to statistical databases, women carrying this mutation have an 87 per cent probability of

developing breast cancer. Although at the time Jolie did not have cancer, she decided to pre-empt the disease and undergo a double mastectomy. She didn't feel ill but she wisely decided to listen to the computer algorithms. "You may not feel anything is wrong," said the algorithms, "but there is a time bomb ticking in your DNA. Do something about it — now!"

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What is already happening in medicine is likely to take place in more and more fields. It starts with simple things, like which book to buy and read. How do humanists choose a book? They go to a bookstore, wander between the aisles, flip through one book and read the first few sentences of another, until some gut feeling connects them to a particular tome. Dataists use Amazon. As I enter the Amazon virtual store, a message pops up and tells me: "I know which books you liked in the past. People with similar tastes also tend to love this or that new book."

This is just the beginning. Devices such as Amazon's Kindle are able constantly to collect data on their users while they are reading books. Your Kindle can monitor which parts of a book you read quickly, and which slowly; on which page you took a break, and on which sentence you abandoned the book, never to pick it up again. If Kindle was to be upgraded with face recognition software and biometric sensors, it would know how each sentence influenced your heart rate and blood pressure. It would know what made you laugh, what made you sad, what made you angry. Soon, books will read you while you are reading them. And whereas you quickly forget most of what you read, computer programs need never forget. Such data should eventually enable Amazon to choose books for you with uncanny precision. It will also allow Amazon to know exactly who you are, and how to press your emotional buttons.

Take this to its logical conclusion, and eventually people may give algorithms the authority to make the most important decisions in their lives, such as who to marry. In medieval Europe, priests and parents had the authority to choose your mate for you. In humanist societies we give this authority to our feelings. In a Dataist society I will ask Google to choose. "Listen, Google," I will say, "both John and Paul are courting me. I like both of them, but in a different way, and it's so hard to make up my mind. Given everything you know, what do you advise me to do?"



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And Google will answer: “Well, I know you from the day you were born. I have read all your emails, recorded all your phone calls, and know your favourite films, your DNA and the entire biometric history of your heart. I have exact data about each date you went on, and I can show you second-by-second graphs of your heart rate, blood pressure and sugar levels whenever you went on a date with John or Paul. And, naturally enough, I know them as well as I know you. Based on all this information, on my superb algorithms and on decades’ worth of statistics about millions of relationships — I advise you to go with John, with an 87 per cent probability of being more satisfied with him in the long run.

“Indeed, I know you so well that I even know you don’t like this answer. Paul is much more handsome than John and, because you give external appearances too much weight, you secretly wanted me to say ‘Paul’. Looks matter, of course, but not as much as you think. Your biochemical algorithms — which evolved tens of thousands of years ago in the African savannah — give external beauty a weight of 35 per cent in their overall rating of potential mates. My algorithms — which are based on the most up-to-date studies and statistics — say that looks have only a 14 per cent impact

on the long-term success of romantic relationships. So, even though I took Paul's beauty into account, I still tell you that you would be better off with John."

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Google won't have to be perfect. It won't have to be correct all the time. It will just have to be better on average than me. And that is not so difficult, because most people don't know themselves very well, and most people often make terrible mistakes in the most important decisions of their lives.

The Dataist worldview is very attractive to politicians, business people and ordinary consumers because it offers groundbreaking technologies and immense new powers. For all the fear of missing our privacy and our free choice, when consumers have to choose between keeping their privacy and having access to far superior healthcare — most will choose health.

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For scholars and intellectuals, Dataism promises to provide the scientific Holy Grail that has eluded us for centuries: a single overarching theory that unifies all the scientific disciplines from musicology through economics, all the way to biology. According to Dataism, Beethoven's *Fifth Symphony*, a stock-exchange bubble and the flu virus are just three patterns of dataflow that can be analysed using the same basic concepts and tools. This idea is extremely attractive. It gives all scientists a common language, builds bridges over academic rifts and easily exports insights across disciplinary borders.





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Of course, like previous all-encompassing dogmas, Dataism, too, may be founded on a misunderstanding of life. In particular, Dataism has no answer to the notorious “hard problem of consciousness”. At present we are very far from explaining consciousness in terms of data-processing. Why is it that when billions of neurons in the brain fire particular signals to one another, a subjective feeling of love or fear or anger appears? We don’t have a clue.

But even if Dataism is wrong about life, it may still conquer the world. Many previous creeds gained enormous popularity and power despite their factual mistakes. If Christianity and communism could do it, why not Dataism? Dataism has especially good prospects, because it is currently spreading across all scientific disciplines. A unified scientific paradigm may easily become an unassailable dogma.

If you don’t like this, and you want to stay beyond the reach of the algorithms, there is probably just one piece of advice to give you, the oldest in the book: know thyself. In the end, it’s a simple empirical question. As long as you have greater insight and self-knowledge than the algorithms, your choices will still be superior and you will keep at least some authority in your hands. If the algorithms nevertheless seem poised to take over, it is mainly because most human beings hardly know themselves at all.

*Yuval Noah Harari is the author of ‘Homo Deus: A Brief History of Tomorrow’, published by Harvill Secker on September 8. He will be speaking in London, Cambridge, Manchester and Bristol. For more information go to [po.st/HomoDeusEvents](http://po.st/HomoDeusEvents)*

*Illustrations by Janne Iivonen*

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