three

NURTURE HUMAN NATURE

from rational economic man to social adaptable humans

Think of the most famous portrait ever painted. It has to be the *Mona Lisa*, the enigmatic painting by Leonardo da Vinci that is reproduced on postcards and fridge magnets the world over. Leonardo was a master in oils but he was a pioneer of pen-and-ink sketches too. While people-watching in the streets of Milan, he invented the art of caricature, those 'loaded' portraits that intentionally exaggerate a person's most distinctive features—be it a bulbous nose or protruding chin—to produce an image that, comic or grotesque, bears an unmistakable likeness to its model.

The *Mona Lisa* may top the list of famous portraits, but it is far from the most influential one. That accolade belongs to an equally enigmatic yet utterly different character who more closely resembles one of Leonardo's caricatures. He is, of course, rational economic man, the self-centred depiction of humanity at the heart of economic theory, who is also known as *Homo economicus* (note how the Latin touch lends him an air of scientific credibility). His image has been drawn and redrawn over two centuries by successive generations of economists and, over time, has become so exaggerated and embellished that what had started out as a portrait turned into

a caricature and ended up as a cartoon.[1] Despite his absurdities, however, rational economic man's influence goes far beyond fridge magnets. He is the protagonist in every mainstream economics textbook; he informs policy decision-making worldwide; he shapes the way we talk about ourselves; and he wordlessly tells us how to behave. Which is precisely why he matters so much.

Homo economicus may be the smallest unit of analysis in economic theory—equivalent to the atom in Newton's physics—but, just like an atom, his composition has profound consequences. There are, most likely, going to be more than 10 billion of us by 2100. If we head towards that future continuing to imagine, conduct and justify ourselves as *Homo economicus*—solitary, calculating, competing and insatiable—then we stand little chance of meeting the human rights of all within the means of our living planet. And so it is time to meet ourselves all over again by taking his cartoon depiction out of the economic gallery and painting, in its place, a new portrait of humanity. It will turn out to be the most important portrait commissioned in the twenty-first century, mattering not just to economists but to us all. Its preparatory sketches are under way and, just as in Leonardo's workshop, many artists are collaborating in piecing them together, from psychologists, behavioural scientists and neurologists to sociologists, political scientists and, yes, economists.

This chapter traces the evolving portrayal of rational economic man that has come to define our economic selves, and reveals the profound impact that it has had upon us. But it also looks ahead to our emerging new portrait, exploring five broad shifts in the depiction of who we are. Each one of those shifts illuminates a critical aspect of human nature which, once better understood, can be nurtured in ways that help us move into the safe and just space for humanity.

The Story of Our Self-Portrait

Rational economic man stands at the heart of mainstream economic theory, but the history of where he came from has been airbrushed from the textbooks. His portrait is painted in words and equations, not in pictures. If it were to be drawn, however, he would have to look something like this: standing alone, money in hand, calculator in head and ego in heart.

Rational Economic Man: the human character at the heart of mainstream economic theory.

Where did this infamous character come from? His most intimate early portrait was created by Adam Smith in two major works, his 1759 *Theory of Moral Sentiments* and his 1776 book known as *The Wealth of Nations*. Today Smith is best remembered for having noted the human propensity to 'truck, barter and exchange' and the role of self-interest in making markets work.[2] But although he believed self-interest was 'of all virtues that which is most helpful to the individual', Smith also believed it was far from the most admirable of our traits, knocked off that top spot by our 'humanity, justice, generosity and public spirit . . . the qualities most useful to others'. Did he consider humankind to be motivated by self-interest alone? Not at all. 'How selfish soever man may be supposed,' he wrote, 'there are evidently some principles in his nature, which interest him in the fortune of others, and render their happiness necessary to him, though he derives nothing from it except the pleasure of seeing it.'[3] Furthermore, Smith believed that

an individual's self-interest and concern for others combined with their diverse talents, motivations and preferences to produce a complex moral character whose behaviour could not easily be predicted.

Lacking a simplified, predictable character at its heart, political economy looked destined to remain mere art, not science. That frustration prompted John Stuart Mill to pare down the description and become—in the footsteps of Leonardo—the first economic caricaturist. Political economy 'does not treat the whole of man's nature . . . nor the whole conduct of man in society', he argued in 1844. 'It is concerned with him solely as a being who desires to possess wealth.' To this desire for wealth, Mill added two other exaggerated features: a deep dislike of work and a love of luxuries. He admitted that the resulting depiction was 'an arbitrary definition of man', based on 'premises which might be totally without foundation', making the conclusions of political economy 'only true . . . *in the abstract*'. But he justified his caricature, confident that no 'political economist was ever so absurd as to suppose that mankind are really thus constituted', while adding that 'this is the mode in which science must necessarily proceed'.[4]

Not everyone agreed: in the 1880s the political economist Charles Stanton Devas coined a now infamous nickname when he derided Mill for 'dressing up a ridiculous *homo oeconomicus*' and examining only the 'dollar-hunting animal'.[5] But by presenting a simplified and predictable character, Mill's caricature opened up the scope for economic theory and apparent scientific method, and so it stuck.

The economist most eager to further Mill's efforts at caricature was William Stanley Jevons. He was inspired by Newton's success in reducing the physical world to atoms and then constructing its laws of motion from a single atom up. So he attempted to model a nation's economy along the same lines, reducing economic activity to what he called the 'single average individual, the unit of which population is made up'.[6] To achieve this, he had to make the caricature even more exaggerated so that human behaviour could be described mathematically, which for Jevons was the ultimate in scientific credibility. He noted that the philosopher Jeremy Bentham had been busy expounding the idea of utility—a 'felicific calculus' based on an ambitious classification of 14 kinds of human pleasure and 12 kinds of pain—in order to provide the quantifiable basis for creating a universal moral and legal code. Seizing upon the mathematical potential of this concept, Jevons drew up 'calculating man', whose fixation on maximising

his utility had him constantly weighing up the consumption satisfaction that he might derive from every possible combination of his options.[7]

With this move, Jevons placed utility at the heart of economic theory —a spot it occupies to this day—and from it he derived the law of diminishing returns: the more of a thing that you consume (be it bananas or shampoo), the less you will desire still more of it. But, despite each one of his desires following such a law of satiation, this economic man knew of no satiation overall. Alfred Marshall put it most vividly in his influential 1890 text *Principles of Economics*. 'Human wants and desires are countless in number and very various in kind,' he wrote. 'The uncivilized man indeed has not many more than the brute animal; but every step in his progress upwards increases the variety of his needs . . . he desires a greater choice of things, and things that will satisfy new wants growing up in him.'[8] Thus, by the end of the nineteenth century, the caricature clearly depicted a solitary man, ever calculating his utility, and insatiable in his wants.

It was a powerfully simple depiction which opened the way to new kinds of economic reasoning. But still it was not enough: the nineteenth-century model of economic man may have been ever-calculating, but he was not all-knowing, and his inherent uncertainty (which forced him to act upon opinion rather than knowledge) barred the way to complete mathematical modeling. Hence in the 1920s, Chicago-school economist Frank Knight decided to endow economic man with two godlike traits—perfect knowledge and perfect foresight—enabling him to compare all goods and prices across all time. This was a decisive break with the old portrait: no longer merely exaggerating recognisably human features, Knight embellished his *Homo economicus* with superhuman powers. And with that, he had turned the caricature into a cartoon. He knew it too: he admitted that his depiction of humanity was loaded with 'a formidable array' of artificial abstractions, resulting in a creature who 'treats other human beings as if they were slot machines'.[9] But economic science needed just such an idealised man to inhabit its idealised economic world, he reasoned, in order to unleash the potential of mathematical modelling, and so he became the world's first economic cartoonist.

Milton Friedman reinforced Knight's justifications in the 1960s, when he defended the cartoon character. He argued that since in real life people behaved 'as if' they were making the self-interested, all-knowing calculations ascribed to rational economic man, then the simplified

assumptions—and the cartoon character they depicted—were legitimate.[10] Crucially, around the same time, that cartoon began to be seen by many leading economists of the day as an exemplar, a model for how real man *should* behave. Rational economic man came to define rationality, recounts the economic historian Mary Morgan, and turned into 'a normative model of behaviour for real economic actors to follow.'[11]

Life Imitates Art

Over the course of two centuries—from the 1770s to the 1970s, as economic man's depiction morphed from a nuanced portrait to a crude cartoon—what had started as a model *of* man had turned into a model *for* man. This matters, argues economist Robert Frank, because 'our beliefs about human nature help shape human nature itself'. Research by Frank and others has revealed, first, that the discipline of economics tends to attract self-interested people. Experimental research in Germany, for example, found that economics students were more likely than other students to be corruptible—willing to give a biased answer—if it led to a personal payout.[12] Research in the United States likewise found that economics majors were more approving of their own and others' self-serving behaviour, while economics professors gave significantly less money to charity than their worse-paid colleagues in many other disciplines.[13]

Beyond attracting self-interested people, however, studying *Homo economicus* can alter us too, reshaping who we think we are and how we should behave. In Israel, third-year economics majors rated altruistic values—such as helpfulness, honesty and loyalty—as far less important in life than did their freshman equivalents. After taking a course in economic game theory (a study of strategy which assumes individual self-interest in its models), US college students behaved more selfishly and expected others to do so as well.[14] 'The pernicious effects of the self-interest theory have been most disturbing,' concludes Frank. 'By encouraging us to expect the worst in others, it brings out the worst in us: dreading the role of the chump, we are often loath to heed our nobler instincts.'[15]

That's a clear caution to all students of economics. But rational economic man's influence on our behaviour goes far beyond the classroom. A striking example was uncovered at the Chicago Board Options Exchange (CBOE)

which opened in 1973 and became one of the most important financial derivatives exchanges in the world. In the same year that the Exchange opened for trading, two influential economists, Fischer Black and Myron Scholes, published what came to be known as the Black–Scholes model, which used publicly available market data to calculate the expected price of options traded in the market. At first, the formula's predictions deviated widely—by 30 to 40 percent—from actual market prices at the CBOE. But within a few years—and with no alterations to the model—its predicted prices differed by a mere 2 percent on average from actual market prices. The Black–Scholes model was soon heralded as 'the most successful theory not only in finance, but in all of economics', and its creators were awarded Nobel-Memorial prizes.

Two economic sociologists, Donald MacKenzie and Yuval Millo, decided to delve deeper into the matter, however, by interviewing some of the derivatives traders themselves. What did they discover? That the theory's increasing accuracy over time was because the traders had started to behave *as if* the theory were true and, so, were using the model's predicted prices as a benchmark for setting their own bids. 'Financial economics,' they concluded, 'helped create in reality the kind of markets it posited in theory.'[16] And as financial markets later learned, when those theories turn out to be flawed, the consequences can be dire.

The Chicago Board Options Exchange, where markets came to mimic market theory.

If rational economic man can reshape our behaviour in financial markets, he is very likely to be reshaping our behaviour in other parts of life too, especially when his priorities permeate our language. One experiment in the United States found that after corporate executives were asked to solve simple riddles involving words such as 'profits', 'costs' and 'growth', they tended to respond to their colleagues' needs with less empathy and even worried that expressing concern for others at work would not seem professional.[17] Another experimental survey found that university students who were invited to take part in a 'Consumer Reaction Study' identified more strongly with notions of wealth, status and success than did their fellow students who were merely told instead that they were participating in a 'Citizen Reaction Study'.[18] Change one word and you can subtly but deeply change attitudes and behaviour. Throughout the twentieth century, widespread use of the word 'consumer' grew steadily in public life, policy-making and the media until it far outstripped the word 'citizen': in English-language books and newspapers, that happened in the mid 1970s.[19] Why does it matter? Because, explains the media and cultural analyst Justin Lewis, 'Unlike the citizen, the consumer's means of expression is limited: while citizens can address every aspect of cultural, social and economic life . . . consumers find expression only in the market place.'[20]

The Twenty-First-Century Portrait

The portrait we paint of ourselves clearly shapes who we become. That is why it is essential for economics to portray humankind anew. By better understanding our own complexity, we can nurture human nature and give ourselves a far greater chance of creating economies that enable us to thrive within the Doughnut's safe and just space. The preliminary sketches for this updated self-portrait are under way, revealing five broad shifts in how we can best depict our economic selves. First, rather than narrowly self-interested, we are social and reciprocating. Second, in place of fixed preferences, we have fluid values. Third, instead of isolated, we are interdependent. Fourth, rather than calculate, we usually approximate. And fifth, far from having dominion over nature, we are deeply embedded in the web of life.

These five shifts in the emerging portrait are fascinating, but there's just one catch: the choice of the artist's model. Over the past 40 years,

behavioural psychology experiments have revealed a great deal about how people actually behave—but which people? Out of sheer convenience, the vast majority of experimental studies, which have been conducted by academic researchers in North America, Europe, Israel and Australia, have used their own universities' undergraduate students as their subjects. As a result, between 2003 and 2007, 96 percent of people studied in such behavioural experiments came from countries that were home to only 12 percent of the world's population. That would be no concern if those subjects' behaviour was representative of people everywhere. But it turns out that it is not. The few cases of research carried out in other countries and cultures reveal that those convenient-to-study university undergraduates actually behave quite differently from most people. That may well be because—unlike the vast majority of humanity—they live in WEIRD societies: ones that are Western, educated, industrialised, rich and democratic.[21]

What does that sampling bias mean for making sense of the emerging portrait? Understanding the range of behavioural differences between cultures and societies—and the reasons behind them—is clearly a subject for much-needed research, but for now, we can count on two givens. First, although human behaviour may vary between societies, one important thing unites humanity: none of us resemble that narrow old model of rational economic man. Second, until a more nuanced and diverse image of humanity has been sketched out, the emerging portrait described in the five shifts below most closely resembles people in WEIRD societies.

From self-interested to socially reciprocating

Adam Smith spotted that self-interest is an effective human trait for making markets work, but he knew it was far from the only one required to make society and the wider economy work well too. Yet in *The Wealth of Nations* his sharp focus on the role of self-interest in markets overshadowed the rest of his rich observations about morals and motivation, and that trait alone was plucked out by his successors to provide the DNA for economic man. Over the following two centuries, economic theory came to be founded upon the fundamental assumption that competitive self-interest is not only man's natural state but also his optimal strategy for economic success.

Stand back and take a look at how people actually behave, however, and that assumption starts to look flimsy. Along with being self-regarding,

we are also other-regarding. We help strangers with heavy luggage, hold doors open for each other, share food and drink, give money to charity and donate blood—even body parts—to people we will never meet. Toddlers just 14 months old will help others by handing them out-of-reach objects, and children as young as three will share their treats with others. Of course children and adults alike often struggle to share—we certainly have the capacity to snatch and hoard too—but the striking fact is that we share at all.[22] *Homo sapiens*, it turns out, is the most cooperative species on the planet, outperforming ants, hyenas, and even the naked mole-rat when it comes to living alongside those who are beyond our next of kin.

In short, along with our propensity to trade, we are also drawn to give, share and reciprocate. That may be because cooperation enhances our own group's chances of survival. In the simplest of terms, we send a clear message to each other: if you want to get by, then learn to get along. And we have learned to get along in very particular ways. According to economists Sam Bowles and Herb Gintis, we WEIRD ones typically practise what is known as 'strong reciprocity': we are conditional cooperators (tending to cooperate so long as others do too) but also altruistic punishers (ready to punish defectors and free riders even if it costs us personally). And it is the combination of these two traits that leads to the success of large-scale cooperation in society.[23] No wonder rating and review systems are so popular in the otherwise anonymous online marketplace. From eBay to Etsy, they turn each participant's track record into their trading reputation, revealing who can be trusted, so allowing conditional cooperators to find each other and thrive even in the presence of free riders.[24]

Our readiness to cooperate and to punish defectors has been most famously demonstrated in the Ultimatum Game, which has been played in many societies beyond Western, educated, industrial, rich and democratic ones. Two players—a proposer and responder who are anonymous to each other—are offered a sum of money to share, typically equivalent to two days' earnings. The proposer suggests how to divide it and, if the responder accepts that division, they each receive their respective shares; if the responder rejects the proposal, however, they both go empty handed. And they only get to play the game once. If, as mainstream theory assumes, people were purely self-interested then responders would accept any amount offered: to turn it down would be to reject free money. But what happens in practice? Responders typically reject proposals that they think

are unfair, even if it means they walk away with no money at all.[25] We humans are ready to punish others for their selfishness, even if it costs us.

The most interesting results, however, emerge from the contrasting ways that different societies play the game. Among North American university students—the archetypal WEIRD community—proposers tend to offer the other player a 45 percent share, and offers below 20 percent tend to be rejected. Meanwhile, among the Machiguenga living in the Peruvian Amazon, proposers tend to offer far less—around just 25 percent—and responders almost always accept their share, no matter how small it is. By contrast, among the villagers of Lamelara, Indonesia, proposers offer to give away almost 60 percent of the money, and rejections are rare.

What explains these wide variations in cultural norms of reciprocity? In large part, the diverse societies and economies in which we live. North Americans live in a highly interdependent market-based economy that relies upon a culture of reciprocity to make it work. In contrast, the hunter-gatherer Machiguenga live in small family groups and meet most of their needs within their own households, with little trade between: as a result their dependence on community reciprocity is relatively low. The Lamelara, in turn, depend upon communal whale hunting for their livelihoods, heading out to sea in large canoes carrying a dozen or more men who must then share each day's catch: strong norms of sharing are essential to their collective success and are reflected in their high offers in the game.

Across diverse cultures, social norms of reciprocity clearly vary according to the structure of the economy, particularly the relative importance of the household, market, commons or state in provisioning for society's needs.[26] People's sense of reciprocity appears to co-evolve with their economy's structure: a fascinating finding with important implications for those aiming to rebalance the roles of the household, market, commons and state in any society.

From fixed preferences to fluid values

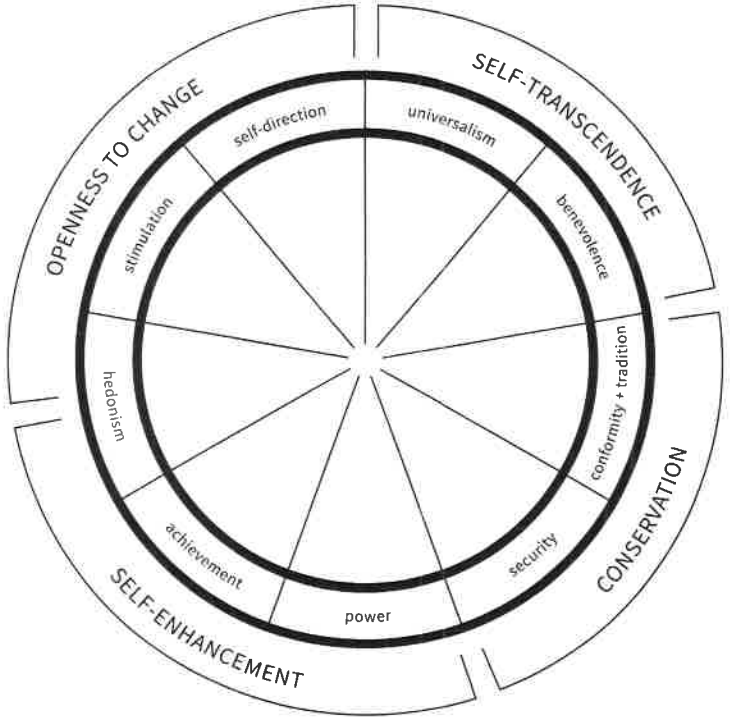
Economic theory curiously begins with the over-18s: it is rational economic man, not rational economic boy, that we first meet—but why? Because the theory hinges on being able to assume that people have pre-set tastes, formed independently of the economy. Few would attempt to deny that corporate advertising grooms children, making the most of their pester power today while seeding the tastes and desires that will draw

their purchasing power tomorrow. But adults can perhaps be portrayed as sovereign consumers, with firms merely aiming to deliver the products and services that match their existing preferences. Under this set-up, any changes in people's shopping habits must largely be due to new product information, a shift in relative prices, or a change in their incomes.

This story is, of course, far from credible. Adults, like children, are by no means immune to the marketeer's message, as Sigmund Freud's nephew, Edward Bernays, realised in the 1920s. 'We are governed, our minds are molded, our tastes formed, our ideas suggested, largely by men we have never heard of,' he wrote in his book *Propaganda*, '. . . It is they who pull the wires which control the public mind.'[27] Bernays invented the 'public relations' industry and rapidly became America's master wire-puller, convincing women (on behalf of the American Tobacco Corporation) that cigarettes were their 'torches of freedom', while persuading the nation (on behalf of the Beech-Nut Packing Company's pork department) that bacon and eggs were the 'hearty' all-American breakfast.[28] Drawing on his uncle's insights into the workings of the human mind, Bernays knew that the secret to influencing preferences lay not in advertising a product's attributes (it's bigger, faster, shinier!) but in associating that product with deeply held values, such as freedom and power.

Those deep values that Bernays masterfully tapped into have since been systematically researched, with profound results. Since the 1980s the social psychologist Shalom Schwartz and colleagues have surveyed people of all ages and backgrounds in over 80 countries, identifying ten clusters of basic personal values that are recognised across cultures: self-direction, stimulation, hedonism, achievement, power, security, conformity, tradition, benevolence and universalism. When it comes to nurturing human nature, three things stand out in their findings.

First, all ten basic values are present in us all, and each one of us is motivated by their full array but to widely differing degrees that vary between cultures and individuals. Power and hedonism, for example, may predominate for some people, while in others benevolence and tradition prevail. Second, each of the values can be 'engaged' in us if it is triggered: when reminded of security, for example, we are likely to take fewer risks; when power and achievement are brought to mind, we are less likely to take care of others' needs. Third, and most interestingly, the relative strength of these different values changes in us not just over the course of a



Schwartz's value circumplex, which shows the ten basic personal values that are common across cultures.

lifetime, but in fact many times in a day, as we switch between social roles and contexts, whether moving from the workplace to the social space, the kitchen table to the conference table, from the commons to the market to the home. And—just like muscles—the more often any one value is engaged, the stronger it becomes.

Schwartz further found that the ten basic values can be grouped around two key axes, as illustrated in his circumplex. The first axis juxtaposes *openness to change* (which concerns independence and novelty) with *conservation* (concerning self-restriction and resistance to change). The second axis juxtaposes *self-enhancement* (focused on status and personal success) with *self-transcendence* (having concern for the wellness of all).

That divide between self-enhancement and self-transcendence is echoed in the contrast between *extrinsic* motivation—which moves us to act in order to achieve a further outcome, such as gaining status, money or some other benefit—and *intrinsic* motivation, which moves us to do something because it is inherently engaging or satisfying.[29] What's more, the ten values tend to influence one another in push–pull ways across these axes. Engaging one value, such as stimulation, tends to activate its neighbours, hedonism and self-direction, while simultaneously suppressing its opposites, security, conformity and tradition.[30]

Such insights into the responsiveness and fluidity of the values that motivate our actions bring far greater nuance to humanity's emerging portrait than did the pre-set preferences of *Homo economicus*, with many implications for how we can nurture human nature, as will emerge below.

From isolated to interdependent

Depicting rational economic man as an isolated individual—unaffected by the choices of others—proved highly convenient for modelling the economy, but it was long questioned even from within the discipline. At the end of the nineteenth century, the sociologist and economist Thorstein Veblen berated economic theory for depicting man as a 'self-contained globule of desire', while the French polymath Henri Poincaré pointed out that it overlooked 'people's tendency to act like sheep'.[31] He was right: we are not so different from herds as we might like to imagine. We follow social norms, typically preferring to do what we expect others will do, and especially if filled with fear or doubt, we tend to go with the crowd.

One telling experiment with the musical tastes of WEIRD teenagers demonstrated just how influential social norms can be. Participants were recruited—14,000 of them—through a teen website and were invited to listen to a set of 48 songs (all unknown tunes by unknown bands) to give them a rating and then, if they wished, to download their favourites. In a control group, participants were given only the name of each band, the title of the song, and a recording of the music before they gave their ratings. In eight other separate groups, however, participants could also see how many times each tune had already been downloaded by others within their group.

The outcome? Across all eight experimental groups, each song's popularity was partly determined by its quality (as rated independently by those in the control group): the 'best' songs rarely did poorly and the 'worst' rarely did well. But a good deal of each song's popularity was also due to social influence: the participants preferred songs that they knew others liked. And the more prominently that other participants' ratings were displayed on the website, the more likely it was for a 'smash hit' to emerge within each group—but, fascinatingly, the harder it became to predict which song the hit would turn out to be.[32] This kind of herd behaviour can be highly contagious and highly uncertain. And it explains the unpredictability not only of the next chart-topping song but also of next summer's fashion craze—not to mention the 'animal spirits' driving boom and bust in stock markets—revealing the strength of social networks in shaping our preferences, purchases and actions.

Social influence of this kind is set to grow as people's lives come to be more tightly networked than ever before, albeit in new ways. As network theorist Paul Ormerod points out, we are more aware than ever before of the opinions, decisions, choices and behaviours of other people. In 1900, around 10 percent of people worldwide lived in cities; by 2050 around 70 percent of us will. Couple this proximity of city dwellers with worldwide communications transmitting news and views, data and ads, and what emerges is a dynamic global network of networks of human beings.[33]

For Veblen, one of the most pernicious effects of such social influence was the rise of what he called 'conspicuous consumption': the appeal of buying luxury products and services to signal our status to others in the hope of 'keeping up with the Joneses'. Joseph Stiglitz points out that this effect is particularly concerning today in the context of high inequality, both within and between countries. There is a 'well-documented lifestyle effect', he notes, in which 'people outside the top 1 percent increasingly live beyond their means. Trickle-down economics may be a chimera, but trickle-down behaviourism is very real.'[34]

What is the implication for economic policy aiming to influence how we behave? Economists have traditionally sought to change people's behaviour by changing the relative price of things, be it through a tax on sugar or a discount on solar panels. But such price signals often fail to achieve their expected results, Ormerod points out, because they can be drowned out by far stronger network effects, thanks to social norms and expectations of what others in the network are doing.[35] At the same time, it may be possible to harness such interdependence for behavioural change, as we will see.

From calculating to approximating

Homo sapiens clearly can't match the infallibility of rational economic man. That much has been agreed upon since the 1950s when Herbert Simon broke rank with his fellow economists and started to study how people actually behaved, finding their rationality to be severely 'bounded'. His findings, augmented by those of psychologists Daniel Kahneman and Amos Tversky in the 1970s, gave birth to the field now known as behavioural economics, which studies the many kinds of 'cognitive bias' that systematically cause humans to deviate from the ideal model of rationality.

Examples abound. We (the WEIRD ones, at least) typically exhibit:

availability bias—making decisions on the basis of more recent and more accessible information

loss aversion—the strong preference to avoid a loss rather than to make an equivalent gain

selective cognition—taking on board facts and arguments that fit with our existing frames

risk bias—underestimating the likelihood of extreme events, while overestimating our ability to cope with them.

There are many more. Indeed, one Wikipedia page lists over 160 cognitive biases, like a jumbo-size game of spot-the-difference between rational economic man and his fallible human equivalent.[36]

What to do in the face of such irrational shortcomings? Introduce nudge policies, say Richard Thaler and Cass Sunstein, which they define as 'any aspect of the choice architecture that alters people's behaviour in a predictable way without forbidding any options or significantly changing their economic incentives'.[37] Thanks to Edward Bernays, brands and retailers have been nudging us for almost a century in the implicit messaging of advertisements, in the placements of products in shops and TV shows, and in the psychology of sales. But public policy can be designed to nudge us too. Displaying fruit at eye level in a school canteen is a healthy eating nudge. Structuring company pension schemes to be opt-out rather than opt-in is a nudge towards long-term income security. Nudge policies, in essence, can be used to encourage us to mimic the way that we would behave if we were as rational as economic man.

Policy nudges can clearly work but the ever-growing catalogue of cognitive biases makes humans start to look rather incompetent: indeed

it starts to seem a miracle that we have survived at all. Just the opposite is the case, argues the evolutionary psychologist Gerd Gigerenzer: we have survived and thrived not despite our cognitive biases but because of them. These so-called biases are the underpinnings of our heuristics, the unconscious mental shortcuts we take every time we use a 'rule of thumb' to make decisions. Over millennia, the human brain has evolved to rely on quick decision-making tools in a fast-moving and uncertain world, and in many contexts those heuristics lead us to make better decisions than exact calculations would do.

The take-the-best heuristic, for example, provides a 'fast and frugal' way of making decisions under uncertainty. Working with hospital medics, Gigerenzer helped to create a simple three-question decision tree allowing doctors to use the best, or most pertinent, information in rapidly assessing whether patients are at risk of a heart attack and should be admitted for coronary care. First, ask Question 1: are there irregularities in the electrocardiogram? If yes, admit for coronary care. If no, ask Question 2: are chest pains the primary symptom? If yes, admit for coronary care. If no, ask Question 3: is any one of five other specific symptoms present? If yes, admit for coronary care; if no, provide a bed in the general ward. Fascinatingly, this method has been found to make more accurate predictions than a medical computer program that gathers and weighs up around 50 pieces of information about each patient.[38] Given the value of fast and frugal heuristics such as this one, perhaps we should think of ourselves not as rational man but as heuristic man and be proud of it too: what first appears to be a failure of rationality might be better thought of as a triumph of evolution.

The power of such heuristics led Gigerenzer to disagree with the prescriptions of behavioural economists who, he says, 'think that people are basically hopeless when it comes to understanding risk, and we need to nudge them into behaviour from birth to death'. Rather than overriding our rules of thumb with a nudge, he argues, we should nurture those heuristic abilities while bolstering them with basic skills in assessing risk. 'We live in the 21st century, surrounded by complex technology, and there are things that we will not be able to anticipate,' argues Gigerenzer. 'What we need is not just better technology, bigger bureaucracy and stricter laws . . . but risk-savvy citizens.' And he has demonstrated that we can indeed learn to become more risk-savvy, by successfully teaching everyday statistical-reasoning skills to German doctors, American judges and

Chinese schoolchildren alike. Rather than be passively nudged into acting wisely, he believes, we can be learn to be risk-savvy with the rule of thumb and so choose to act wisely ourselves.[39]

It's an appealing and empowering approach, but one problem with relying upon heuristics won't go away: they work best in the context for which they evolved. Humanity's context, however, has changed over the past 10,000 years and particularly dramatically in the last two hundred years. Take the devastating effects of climate change, for example: at first they tend to be invisible, delayed, gradual and distant: four characteristics that our heuristic decision tools are infamously bad at handling well. The smart way forwards, then, for policymakers seeking to promote behaviour change may lie in encouraging a judicious mix of risk-savvy heuristics and behavioural nudges, based on a much-needed understanding of when each approach might work best.

From dominant to dependent

A new economic self-portrait must reflect the way that we see humanity's place in the world. The traditional Western depiction of man has nature lying at his feet and at his disposal. 'Let the human race recover that right over nature which belongs to it by divine bequest,' wrote the seventeenth-century philosopher Francis Bacon.[40] That perspective was echoed by W. Arthur Lewis, founder of development economics, in his 1949 book, *Economics: Man and His Material Means*, which set out to study 'the ways in which mankind tries to wrest a living from the Earth' by making 'the most efficient use of scarce resources'. This presumption of man's dominion over nature runs far back in Western culture, at least to the Bible's opening verses. It also underpins the language of environmental economics, which frames the living world as a storehouse of 'natural resources', as if it were waiting—like a pile of Lego blocks—to be transformed by man into something useful to man.

Rather than presiding at the pinnacle of nature's pyramid, however, humanity is woven deep into nature's web. We are embedded in the living world, not separate from or above it: we live within the biosphere, not on the planet. As the American ecologist Aldo Leopold deftly put it, we need to transform the way we see ourselves, 'from conqueror of the land-community to plain member and citizen of it'.[41] Thanks to 40 years of Earth-system research, we have a rapidly improving scientific understanding of how the

Holocene epoch—with its stable climate, ample fresh water, protective ozone layer, and abundant biodiversity—has enabled humanity to thrive, and hence how we depend upon Earth's continual flourishing in turn.

This shift in perspective—from pyramid to web, from pinnacle to participant—also invites us to move beyond anthropocentric values and to recognise and respect the intrinsic value of the living world. 'What's really needed', suggests the thinker Otto Scharmer, 'is a deeper shift in consciousness so that we begin to care and act, not just for ourselves and other stakeholders but in the interests of the entire ecosystem in which economic activities take place.'[42] The need for such a shift in consciousness is particularly strong in WEIRD societies: in the United States, for example, children growing up in urban centres today have a far more simplistic and anthropomorphic understanding of the living world than do children raised in rural Native American communities.[43] One practical way to address this would be to teach and embody eco-literacy in every school so that coming generations develop a worldview based upon understanding the living world's interdependent systems that make life on Earth possible.

Changing our sense of how we belong in the world also depends upon finding better words to describe it. The political theorist Hannah Arendt once noted that a stray dog has a greater chance of surviving if it is given a name.[44] Perhaps in that spirit, mainstream environmental economists now describe the living world in terms of the 'ecosystem services' that it provides and the wealth of 'natural capital' it contains. But the names we choose matter: calling a stray dog Champ rather than Scamp switches just a couple of letters but utterly transforms how he is seen in the world. And that is precisely why talking of 'natural capital' and 'ecosystem services' is so double-edged: it may give the stray dog a name, but the chosen name simply shifts the living world from being man's material means to being an asset on his balance sheet. When Chief Oren Lyons of the Iroquois Onondaga Nation was invited to address students at the University of Berkeley's College of Natural Resources, he highlighted this risk. 'What you call resources we call our relatives,' he explained. 'If you can think in terms of relationships, you are going to treat them better, aren't you? . . . Get back to the relationship because that is your foundation for survival.'[45]

No wonder new economic thinkers are searching for words that better describe how we belong in the world. The biomimicry expert Janine Benyus—whose ideas we will explore in Chapter 6—eloquently speaks of

Earth as 'this home that is ours but not ours alone'. For the ecological writer Charles Eisenstein, it is time to recognise ourselves as 'the connected living self in co-creative partnership with the Earth'.[46] This kind of language makes some people squirm, but perhaps that is because it confronts us with the awkwardness of acknowledging our most profound yet most neglected relationships. It also indicates just how unused we are to talking about ourselves this way, a little like fish searching for a word for water. How do we belong in this world, and what is our role? Finding the words to say it may turn out to be more important than we can imagine in determining whether or not we as a species can learn to thrive with others.

These five shifts provide preparatory sketches for humanity's twenty-first-century portrait, but the work is still far from finished. First, we need to understand more about our economic selves beyond how we behave around money. Just as WEIRD students turn out to behave unlike most other people, so too money may turn out to affect our behaviour quite differently to the way that most other things that matter to us do. How might the Ultimatum Game be played if those involved were asked to share not money but food, water, healthcare, time or political voice? It is deeply unlikely that money invokes the very same sense of fairness as do these other things that we value deeply. In addition, we need to understand a good deal more about who all of us are, not just the WEIRD ones. A greater diversity in experimental research will no doubt reveal some more fascinating differences between peoples and cultures, but we may ultimately discover that—in the words of the late British MP Jo Cox—we have 'far more in common with each other than things that divide us'.[47]

How, then, can the insights from these five shifts in our self-portrait be harnessed in ways that can help to bring all of humanity into the Doughnut? This question will keep returning throughout the following chapters but one issue deserves particular attention here: the growing use of monetary incentives in policies aimed at ending human deprivation and ecological degradation. Initial evidence suggests that monetary payments often crowd out existing motivations by activating extrinsic rather than intrinsic values. As the case studies described below reveal, there may be far wiser ways—drawing on what we now know about values, nudges, networks and reciprocity—to nurture human nature towards the Doughnut's safe and just space.