

ANNIVERSARY SPECIAL

16-31 MAY, 2024

Down To Earth

FORTNIGHTLY ON POLITICS OF DEVELOPMENT

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SCIENCE BEHIND

SINNS

Conversations on

PRIDE, GREED, LUST, ENVY, GLUTTONY, WRATH, SLOTH

32nd ANNIVERSARY

A MIRROR CALLED *DOWN TO EARTH*

SUNITA NARAIN

IT'S THE 32nd anniversary of *Down To Earth*, and over these years, the world seems to have turned on its head. When we began in 1992, the Rio Earth Conference was a month away and a climate change agreement was on the agenda. This was when the world had realised that it was interconnected and what one country would do within its territory could impact another. Leaders came together to frame rules for ecological globalisation—how emissions could be mitigated and how common futures could be shared. We wrote about this from Rio, explaining that much more needed to be done to build a cooperative world order that was based on equity and inclusion. In June 1992, we put the leaders' group photograph on our cover, saying this was a class that failed. A few years later, skirmishes over the global agreement for free trade started; we reported on this, saying that liberalisation of trade should not come at the cost of people or the Planet.

As I write today on our 32nd anniversary, it seems that we are in reverse gear. The world, instead of moving ahead on the critical and existential challenge of climate change, is more divided, hateful and more fractured than it was in 1992. The incredible technological advances have not been enough to stem the climate crisis. At the same time, societies across the globe are grappling with an economic system that is not working for all. It is making the rich richer and the poor poorer. It is also destroying our environment—and let's be clear that even if rich societies have no visible pollution of plastic litter on their roads or black toxic smoke in their air, things are not good for them as well. Their cost of cleaning up is so high that the only way they can afford it is by exporting production to the rest of the world, or by externalising it and adding to emissions in the atmosphere. Now, instead of proselytising about the virtues of free trade, the rich countries are reversing towards domestic manufacture. The two global superpowers—the US and China—are the warring elephants, and as says the African proverb, it is the grass that is getting trampled and

destroyed. The new-gen war is weaponising green technology and the minerals needed to get us there.

This, then, is the life journey of our magazine—to bring you the news, analyses and perspectives on what really matters. And our job is not done; it's not even close. The fact is that the world needs, more than ever, to be shown the mirror—beauty and blemishes and all. We need on the one hand to keep telling the stories from the ground up. We need to hear the voices of the people on the margins, who are today worse off because of constant hits of extreme weather. But we also need to look—and however difficult it may be—for stories of courage, of inspiration and of innovation. We need to keep our sights firmly on the need for change.

What is most important for any publication today is to keep the trust of its readers. In the

**IN THIS TIME OF
HALF-TRUTHS AND
NO TRUTHS, WE ARE
DETERMINED TO OFFER
JOURNALISM THAT IS
FACT-BASED AND RIGOROUS**

last decade, this has been the fundamental flaw of the information systems; on the one hand we have a partisan and polarised global media and on the other hand, we have a divisive social media that is loud but often not accurate. It is a time of half-truths and no truths in the likes of the WhatsApp university. This is why at *Down To Earth*, our most precious gift is your continued belief in our work.

I know this, because I hear from you—I get an email if we make even the smallest of factual errors on our pages; or if our work does not meet your standards. I take every one of your comments to heart; we all do. This is critical. We need to know that you read us. We need to know that you expect from us the kind of journalism that is fact-based and rigorous. This is our promise. Do stay with us on this journey. Together, we will make a difference. [DTE](https://www.dte.org.in) [@sunitanar](https://www.instagram.com/sunitanar)

32nd ANNIVERSARY

DownToEarth

Founded in 1992 to arm you with knowledge critical to shaping a better world

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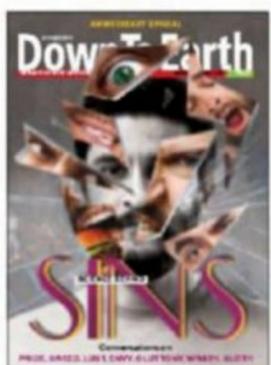
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What are emotions? How does the brain control them? Did they play a role in human evolution or are they an after-effect? With the 'seven deadly sins' as a starting point, **ROHINI KRISHNAMURTHY** speaks to experts from across the world to explore the latest research on human emotions



JESSICA L TRACY | P8

A professor of psychology at the University of British Columbia, Canada, Tracy works on moral thinking and emotions. Her book, *Take Pride*, explores how pride has shaped our minds and culture



DANIEL SZNYCER | P10

An assistant professor at the department of psychology, Oklahoma State University, US, Sznycer studies cross-cultural evidence on shame, pride, compassion and envy, and their role in altruism, social exclusion and conflict



PRIDE

GREED

MARCEL ZEELBERG | P14

A professor of economic psychology at Tilburg University, Netherlands, Zeelenberg studies the role of emotions and motivational factors in decision-making. His laboratory devised a scale to measure greed



RAHUL OKA | P18

An associate research professor at the University of Notre Dame, US, and an economic anthropologist, Oka's research interests include development of socio-economic systems, and evolution of inequality and conflict



KARLIJN HOYER | P22

A postdoctoral researcher at the University of Amsterdam, Netherlands, Hoyer has worked on greed, bringing out the complexities of the emotion



CONVERSATIONS

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HELEN FISHER | P26

A visiting research associate at the department of anthropology, Rutgers University, US, Fisher works on the evolution of sexuality, marriage, divorce and gender differences, and has authored six books



AARON SELL | P46

An associate professor of psychology and criminology at Heidelberg University, US, Sell's research interests include anger, hatred and aggression. Sell has an upcoming paper on extreme anger



XIAOMENG XU | P30

A professor of experimental psychology at Idaho State University, US, Xu's work focuses on romantic relationships and behavioural health. She has also probed links between romantic relationships and mental health



OLGA M KLIMECKI | P50

A psychologist, neuroscientist and senior researcher at the University of Geneva, Switzerland, Olga's work on neural mechanisms showed that a particular brain region could be involved in controlling anger

LUST



JENS LANGE | P33

An assistant professor at the University of Hamburg, Germany, Lange's work focuses on emotions and their links with personalities. Lange also studies envy and its two important forms—benign and malicious



ALESSANDRO GRECUCCI | P54

An associate professor at the University of Trento, Italy, Grecucci studies how humans perceive, modulate and express emotions in normal and abnormal conditions

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WRATH

SLOTH



ANDREW OSWALD | P36

A professor of economics and behavioural science at the University of Warwick, UK, Oswald has investigated the role of envy in economic success and well-being

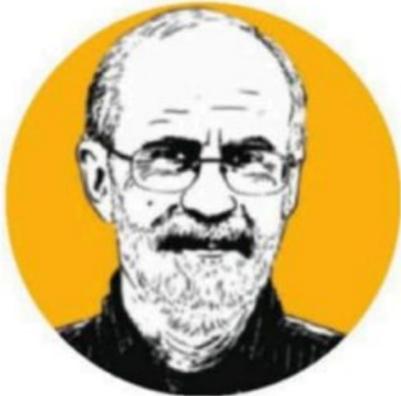


MICHAEL INZLICHT | P57

A professor of psychology at the University of Toronto, Canada, Inzlicht uses tools such as social psychology and cognitive science to unravel how humans use mental efforts to reach their goals

ENVY

GLUTTONY



WILLIAM B IRVINE | P40

Professor emeritus at Wright State University, US, and author of eight books, Irvine has written a chapter, "Gluttony: Religious and Philosophical Responses to the Obesity Epidemic" in the book, *Obesity Prevention*



NOBUHIRO HAGURA | P60

A senior researcher at the Center for Information and Neural Networks, National Institute of Information and Communications Technology, Japan, Hagura co-authored a paper in *eLife* in 2017 on how humans are hardwired to be lazy



NATHAN H LENTS | P43

A professor of biology at John Jay College of Criminal Justice, US, Lents works on the evolution of the genome to understand what makes humans unique, and has authored two books



TODD McELROY | P64

An associate professor at the department of psychology, Florida Gulf Coast University, US, McElroy studies decision-making and how psychological processes influence physical activity



32nd ANNIVERSARY

THE ALCHEMY OF EMOTIONS

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***I felt for the tormented whirlwinds
Damned for their carnal sins
Committed when they let their
passions rule their reason***

DANTE ALIGHIERI



Pride, greed, lust, envy, gluttony, wrath and sloth: religions have whipped up these emotions as deadly sins, as sentiments that must be shunned lest one strays from the right path. Science, however, does not look at them as outright negatives. It treats them as complicated ideas that have played a crucial role in humans' evolutionary success, even made them what they are.

The scholarship on these concepts has grown over the years. Psychologists, anthropologists, sociologists, even economists, now study them through different lenses to analyse their role not just in human evolution but also in today's times, in ensuring one's mental health or financial well-being, for instance. They are conducting complex scientific studies to examine, explain and explore the rationale behind emotions.



They still do not understand them clearly or completely. How are emotions affected by cultures or genes or the brain? What are their key triggers? Do they have physical and mental costs? Do animals have feelings that correspond to human emotions? Are emotions just human expressions or are we engineered to experience them for some existential benefits?

Rohini Krishnamurthy speaks to scientists and authors to take stock of what we know so far, the historical debates around these emotions and the critical gaps in our understanding. The 32nd anniversary edition of *Down To Earth* documents these conversations that emphasise one point: emotions are innate to human existence and a part of their biological being.

Illustrations by Yogendra Anand

PRIDE

JESSICA L TRACY

Pride evolved in humans to help them navigate through hierarchy, improve status

Is pride a social or evolutionary emotion?

Pride is the emotion that provides the foundation for our social hierarchy, and every society has a hierarchical system. We have evidence to suggest that pride evolved in humans. It is universal in humans, and it evolved to help people navigate the status hierarchy.

When we feel pride because of our success, we think we deserve a higher status. And we show pride non-verbally, sending an automatic message to others that we deserve higher status. And it is present across cultures. So pride is a critical part of how we get status. Setting aside the evolutionary benefits, at an individual level, pride is something that motivates us all the time. We wish to build an identity that our society approves of. So pride is the reason why we basically work hard and do all the good stuff that we do, whether it is achieving, or behaving morally, or caring for others.

Do we understand pride in the context of human evolution?

I did a lot of work to test whether pride is universal; if it is part of human nature or if we just acquire it. All the studies we have done so far point to pride being part of human nature.

In Burkina Faso in West Africa, we found that people living in a small-scale traditional society, cut off from the rest of the world, identified pride in non-verbal expression the same way that Americans did. This suggests that pride is probably universal. We looked at Olympic athletes and found that these judo

athletes showed pride, no matter where they were from, after they won a match compared to when they lost. We looked at blind athletes in the Paralympics Games, including congenitally blind athletes (who have never been able to see), and they showed the same response. To me, that is really strong evidence that pride is innate to human nature. People who could not have learned to show pride from watching others, display pride in response to success.

There is evidence to show that non-human primates also have the pride emotion. Chimpanzees show something that looks a lot like pride right before they are about to fight another chimpanzee and it is probably their way of saying: "Hey, watch out, you do not want to fight me."

I think, there is good evidence to suggest that pride has evolved. Theoretically it makes sense as well, because it promotes high status. So, people who show pride are awarded higher status. When others look at photos of the pride expression, they have an automatic tendency to see them as high status, whether it is in America, Fiji or a traditional society.

Our behavioural studies find that people who show pride are more likely to be treated as leaders and given power. From an evolutionary perspective, that is really adaptive.

Are there cultural differences in how people view pride?

The way that pride is viewed varies a lot by culture. In the US, where I have started studying pride, people think of it as the good kind. In other places, perhaps in



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NON-HUMAN PRIMATES ALSO HAVE THE PRIDE EMOTION. CHIMPANZEES SHOW SOMETHING THAT LOOKS A LOT LIKE PRIDE RIGHT BEFORE THEY ARE ABOUT TO FIGHT

India, people think of pride as bad. I think that difference is really a cultural thing.

These differences, I would suspect, may have something to do with individualism versus collectivism. So, that is sort of the major cultural difference that I am seeing between countries. This is just my observation and I have not systematically studied this. But it makes sense that in a highly individualistic culture, where the emphasis is on standing out, pride could be viewed as a good thing because pride is what motivates you to stand out and do the thing. So, authentic pride being a good pride is going to be overemphasised.

Collectivistic cultures, where emphasis is on group success and individualism is downplayed, display of pride can be problematic. It could actually disrupt social harmony.

Pride has two facets: the authentic and the hubristic. The former is

associated with achievement and the latter with arrogance. When did this distinction between the two come about? Did it change how pride is viewed?

I think, scholars have known about this distinction for millennia. Aristotle and Rousseau talked about it. But in psychology, pride was not studied. When I began to study it, what I quickly realised is that there are two different kinds of pride. I had done some work with self-esteem and narcissism and the distinction between those two constructs.

I realised that there are two kinds of pride. You have this one pride that is all about achievement and self-worth, feeling confident and wanting to put in hard work that is relevant to self-esteem. Then you have the other kind of pride that is all about arrogance and egotism and inflated ego, probably due to feelings of insecurity. That is why people engage in arrogance. And that is more linked to narcissism. **DTE**

PRIDE

DANIEL SZNYCER

We are working on a purely social theory of pride that seeks the reason why we have that emotion

Is pride scientifically defined?

There is some consensus on pride. At the same time, there are different theories on it. We are working on a theory—purely, a social theory of pride—that seeks the reason why we have pride. For us, pride has two functions: a prospective function and a retrospective function.

In retrospective function, if one has achieved something in the past, s/he advertises it. The person lets others know about the achievement. And not only do they advertise, they also demand, for example, better treatment by others, corresponding to the new worth of the individual. In prospective function, this emotion guides action because it tells the individual which actions or trades or achievements are liked by other people in your group. So, with this information, the individual can, in the most cost-effective and efficient manner, choose the best thing to do to become, for example, a billionaire.

But if the individual does not have the abilities to become a billionaire, then s/he goes for the next best, or the 17th best option, by playing soccer, for example. So, I will get more valuation from others, and getting more valuation from others means that, behaviourally, they will treat you better. They will be more willing to help you, incur costs to help you. So, that is an interpersonal or a social theory of pride.

The reason why pride exists is because it is useful to obtain the valuation from others in terms of status and liking and support. Pride is not so much a function of other people, but a function of the self and how I myself interpret events. It is a

psychodynamic theory of pride. It is more about how the self views itself. The other theory I am working on is much more social. I feel pride and I guide my actions based on how I think of other people, or how I expect that other people will see me or should see me.

Is there a clear difference between pride and confidence?

There are several relationships. Confidence is an internal state, a measure that tells you how confident you are about something, your degree of certainty about achieving something. This is an internal variable that may regulate behaviour because if you are confident that you can make a toy out of wood, you do it. And if you do not, you buy it.

One of the components of pride is confidence. If you have pride, underpinned by actual achievement and validated by other people, then you have confidence. This confidence in your social worth is very important. Psychologist Mark Leary of Duke University, US, and others have shown that self-esteem, like self-confidence, is a function of how much I think that other people value me and include me as opposed to excluding me. So pride includes this component of self-confidence or self-esteem. It also includes additional components, like the way one advertises oneself, like, “I am great.”

Is pride a valuable emotion or trait for a social species?

Pride is a kind of a double-edged sword. On the one



PRIDE LEADS TO PRODUCTION OF SOCIALLY VALUABLE THINGS. BUT IF YOU PRODUCE SOCIALLY VALUABLE THINGS TOO MUCH, ACHIEVE GREAT THINGS AND HAVE A SUPER HIGH STATUS, PEOPLE COULD RESENT YOU FOR THAT

hand, it is socially good because it motivates the individual to invest in courses of action, in things that other people value. It is kind of an internal price system that guides your behaviour. As a by-product of that guidance, it causes people to produce things so that other people value you. So, it is a socially good system in that sense. It leads to the production of socially valuable things. But at the same time, if you produce socially valuable things too much and have achieved great things and have a super high status, people could resent you for that, even if they are benefitting from the value you produce. Because of the value a person possesses, others are more likely to help them.

Do people without valued skills also show pride?

It makes for a dangerous situation if someone holding a position of power displays pride as they feel entitled to better treatment from the community despite not having achieved anything good or do not have the means to be valued.

This poses the risk of producing anger and aggression because the person is essentially demanding to be treated better for nothing, with no corresponding increase in their worth and no increase on the goods or the services that they can provide to the community. And, therefore, the reaction of the public is understandably negative. So,

THERE IS PRIDE THROUGH ACHIEVING GOOD THINGS. BUT PRIDE CAN ALSO COME FROM BEING POWERFUL AND INTIMIDATING. THAT'S THE OTHER SIDE OF PRIDE

unwarranted pride can certainly and does certainly lead to anger, aggression and resentment from people.

There's a saying in the Bible: "There's pride before fall". It means that the fall of an individual is preceded by pride. This usually happens when the pride is unwarranted.

But another reason why you might have pride,

two ways. A community may value a person because s/he produces a lot of good things like piano, soccer, medicine, and the like, or because s/he is very strong—has weapons or powerful allies. So, the person may not be producing good things, but if they have all the power, they can, in effect, force or intimidate people to treat them better. So, there is pride through achieving good things, but there also can be pride that comes from being powerful and intimidating. And that's the other side of pride.

You have done studies on pride across different cultures. Do you see differences across countries in how pride is viewed or how it is experienced?

Yes, there are subtle differences. The first thing to notice is the similarities. There are massive, important similarities within cultures and across cultures. Pride system has a map of how valuable other people think of certain achievements. And that helps the individual to invest in different courses of actions in a way that matches what people actually value, so that they can become more valuable cost-effectively. And this relationship, moreover, is seen not only within each of 16 countries covered in my study, which includes the US, Japan, Italy and Turkey, but it is also seen between countries.

There are things that elicit pride differently across cultures. We did detailed tests in India and the US to find actions that are valuable in India, but not in the US, and vice versa. For example, a butcher selling steaks in the US may feel pride if they do a good job. But if you kill cows in India that may not lead to pride; that may lead to outrage from people. So, yes, there are cultural differences and pride tracks those cultural differences in value. **DTE**

even if you have not exactly achieved something great, is because you have power. If you have power, be it because of your dad, uncle or mom, the king or the queen or a politician, you may act in a way that is very similar to pride, or exactly the same as pride, namely demanding a lot of respect from other people.

So the logic of social valuation in humans plays out



THE/NUDGE Prize



Automated Irrigation to Make Every Drop Count for Smallholder Farmers

Solving India's water crisis is particularly difficult because the agricultural sector which accounts for 80% of the country's water use is highly fragmented, with smallholder farmers making up 86% of farming households.

We know which crops are the most water intensive - sugarcane, wheat, rice and cotton, but it's not enough to create solutions for these crops. We have to factor in the varying realities and challenges of the smallholder farmers who grow them. Many promising technological solutions fail because they are not affordable or profitable for a smallholder farmer, although they might work well in bigger farms or when paired with better resources.

For example, advanced analytics and precision agriculture can all help, but it might not work for every farmer everywhere. To solve this puzzle, we need solutions that approach the problem from different angles, rather than try and scale a few high potential approaches.

Automating irrigation can help, but we need automation that bridges the gap from monitoring to execution in real-time, and is practical and reliable in small farms. This enables optimal water usage, preventing issues like over or under-watering while reducing manual labour requirements.

The DCM Shriram AgWater Challenge, a startup challenge sponsored by DCM Shriram Foundation and run by The/Nudge Prize was set up to find innovative solutions that help smallholder farmers gain more control over their farming operations through practical solutions that work on the ground and demonstrate visible benefits and returns for them. Several organisations competing in the challenge are working on making irrigation automation viable for these farmers, tackling this need.

Oscillo Machines has created a product known as the Suvarna 4R eRT, a diesel-run paddy transplanter. The traditional nursery-grown method in paddy is water-intensive, as it requires the nursery to be flooded continuously. Direct Seeded Rice (DSR) is more water efficient, but it is often hard to get farmers to transition.

The Suvarna 4R eRT directly addresses this, with a combination method. The machine has one component that transplants rice seedlings that were raised in a nursery bed into a portion of the main field, while the other part of the same machine drills and directly sows rice seeds into another portion of the main field. This lets the farmer use both cultivation methods simultaneously, and slowly transition to DSR in more areas as it starts working well. This new method also reduces manual work and drudgery for farmers, reducing effort as well as cost.

SICCA by SenseitOut Technologies is another organisation that makes automation practical, with retrofittable IoT systems that can be integrated into existing drip irrigation systems, which then uses advanced wireless tech for remote control of irrigation schedules based on soil data. This lets smallholder farmers harness the benefits of automated irrigation without major infrastructure changes.

The Centre for Environment Concerns has a complementary SWAR system - a root zone moisture diffuser which can be attached to existing drip irrigation systems and automatically applies water or not based on real-time soil moisture levels detected by it near the roots. This improves crop productivity while significantly reducing water consumption.

While these companies apply technology at the soil level, Intech Harness focuses on water pumps,

with an AI-driven motor controller. Since many smallholder farmers rely on water pumps powered by erratic power supply, they often use water inefficiently and ruin crop productivity, as they struggle to turn it on and off at the right time. Intech Harness' IoT connected system automates pump operations, eliminating manual intervention and optimising irrigation, saving both water and crop productivity.

What sets these solutions apart is their emphasis on automating the entire irrigation cycle, from data monitoring to intelligent control of water application equipment like pumps, valves, and diffusers. Moreover, by ensuring accessibility through retrofitting capabilities and accommodating traditional practices, these solutions are democratising cutting-edge irrigation automation tech for resource-constrained small farmers by making solutions accessible & practical. This level of automation not only conserves precious water resources but also improves overall irrigation efficiency, resulting in higher crop productivity and cost savings for smallholder farmers.

We need solutions for every type of farmer, and such all-in-one solutions promise to make efficient water use and high crop yield a reality for everyone. By tackling the challenge from different angles - automating transplanting, retrofitting IoT systems, optimising pump operations, and targeting root zones - these organisations are providing a comprehensive suite of irrigation automation tools tailored to the diverse needs of smallholders across India.

"This article is one part of an 8-part series covering agricultural water utilisation in India."



GREED

MARCEL ZEELENBERG

Evolutionary biology sees greed as a way to increase your chances of survival

What does science say about greed?

We define greed as the insatiable desire for more, for people wanting to acquire more than they need. In doing so, they prevent other people from getting access to resources. Religions condemn greed because if you are greedy, you hurt others. But we think greedy people have no intention or purpose to hurt others. So, some people define greed also as harming others, but we believe it is merely a by-product of being greedy. And we have done research where we measured the extent to which greedy people take other people's outcomes into account. We found that greedy people are oblivious to others. They do not want to hurt others but also do not want to help them. They simply do not care about others.

If you collect more coconuts than you need, I think you are greedy. So, I think, you experience this without being around other people. It might be a consequence, but I do not think harming others is essential. So, the views are a little bit different on the definition of greed. We used this definition to develop our scale to assess greed. Other people have also defined those scales and some include harming others in their definitions.

How has the scientific view on greed changed over the years?

Well, the research on greed is pretty recent. We published two papers in 2015. When we started to examine research on greed, we found that there was hardly anything. We had philosophical work. Economists have talked about it, and so have religious

scholars. But nobody studied it. There was a really interesting review article in 2011 in the *Academy of Management Annals*, and they said that there are lots of theories but hardly any research because it is really hard to define what greed is.

Now I disagree with that, but they were right in the observation that there is hardly any research. So the views on greed have changed over time, but not really in academia, because the research is just too recent.

The views on "what greed is and how bad it is" have changed enormously over time. Religions viewed them as bad but capitalism sort of changed that by normalising views of earning money, becoming very rich and chasing money. If you look at when people think or write about greed, you will find that most people are negative, but the people who view it positively are economists, who very much believe in rational self-interest and total free markets. Evolutionary biologists, too, agree that greed is good because by being greedy, you might take too many resources, but, for example, it might be useful in times of scarcity. This is a way to increase your chances of survival. So evolutionary biologists and economists are positive about it. Most people, or at least religious thinkers and philosophers, are often negative about it.

If I have to talk about myself, I am more or less neutral about it, because I think it is a human trait that is found more in some and less in others. I do think there are negative consequences of being greedy. But I do not find it useful to either praise or condemn it because it is just a part of being human. I find it more interesting to find out what greed is and when it works.



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I DO NOT FIND IT USEFUL TO EITHER PRAISE OR CONDEMN GREED... I FIND IT MORE INTERESTING TO FIND OUT WHAT GREED IS AND WHEN IT WORKS

You have developed a scale for greed. What does it involve?

We published the scale in 2015. We measure what is called dispositional greed. A dispositionally angry person is frequently angry. If you are dispositionally anxious, you are always anxious about things, or you can be afraid of something momentarily.

Now, for greed, I would say the same thing happens. You can become greedy because, in a specific situation, something is available in enormous abundance. Or if you go to the shop when something is on sale or discounted, it may make you greedy. But that is not what has been studied most of the time. Most studies have focused on trade greed. Some people are more greedy than others and we can

measure that and then we can relate that to different behaviours. The reason for us mostly studying dispositional greed is that we have not been able to induce greed in our experiments.

For example, I also study regret. I can induce this by asking people to make a decision and then make sure that the decision goes badly for half of them. For the other half, the decision goes well. But we do not yet know how to induce greed in people. We have ideas about it. We have tested a few things, but we have not gotten to a good operationalisation of them.

One of the things we do, for example, is that we assess greediness in a group of people, and then ask them about how acceptable they find several immoral things. Imagine you go to the store; you buy

something for €5 but pay with a €20 note. The cashier accidentally gives you back the change for €50. How acceptable is it? Would you just keep the money without saying anything? You find that the more greedy people are, the more acceptable they find it to keep the change. Or we ask them, how acceptable is it to lie on your tax declaration? We see that the more greedy people are, the more they think it is acceptable. If you ask people whether they have done things like that, the greedier people are more likely to say they have engaged in those behaviours.

Can your scale tell us how greedy is too greedy?

We cannot say that based on whether your score is too high or low. We find that there is a relation,



though. In one of our studies, we asked people to play a game. It is called a resource dilemma. The game requires four players. They have to maintain 20 hectares of forests and are allowed to harvest wood and sell it. But if they harvest too much wood, the forest depletes. It does not grow back and they run out of money. After each round of the game, they have to decide how much wood they want to harvest and sell.

We find that greedy people harvest more than their non-greedy counterparts. Greedy people also

harvest too much if you compare it to what they should harvest for the forest to regrow. But we also find that people, who score very low on the greed scale, harvest much less than they could do. So they leave money on the table. We find that greedy people take too much, and the non-greedy people take too little. Taking too little, I think, is less of a problem. It is more of a problem for you because you do not generate or generate less income. But taking too much, of course, is a problem for society. It is really hard to say on our scale whether this is too much greed or this is too little.

Also, we found in one of our studies that greedy people work harder. It was a cool experiment. We brought people to the laboratory and told them they could first work for five minutes and then earn chocolates for that. We also told them that they have five minutes to eat the reward. And if they do not eat, they are instructed to return the chocolates.

We also explained what work they were required to do. We made them sit in the laboratory with their headphones on, listening to nice classical music. So this is considered leisure. They were also asked to press the spacebar on the computer to interrupt the music with white noise. And that is annoying. According to economists, work is aversive and leisure is pleasant. So in this case, leisurely listening to music was pleasant and the work of interrupting it was aversive. Every 20 times the participants pushed a button, they earned a chocolate. Their task was to earn as many chocolates as they wanted in five minutes.

We found that greedy people earned much more chocolate than non-greedy people, but they could not eat them all. So they had to give them back. When I talked about these results at conferences people said that if the task was repeated with the same participants, greedy people would not earn as much.

So we repeated the same experiment three weeks later with the same participants. We still found that greedy people earn way too much.

We also found that greedy people were dissatisfied with their performance. The question for us is also, why do they do that, because they should know better? But maybe greedy people are also a little bit competitive with themselves. They may want to outperform themselves. **DTE**



GREED

RAHUL OKA

Greed is good, bad and neutral

Anthropologists define greed differently than an evolutionary biologist or a psychologist.

Why is it so?

This is one of the biggest issues. If you take five academics and ask them to define greed, they might come up with 10 different explanations. There are questions on whether greed is a deontological phenomenon, meaning if greed should be defined without any context or without any look at its consequences. And the opposite of deontological is consequentialist, which is if greed should be defined by its consequence.

A particular behaviour might seem greedy to some, but if the consequences are not negative, would it still be greed? It might be seen as ambition, too. It might be seen as something that we now value in our business executives. Gordon Gekko, a fictional character appearing in the popular 1987 movie *Wall Street* famously said greed is good. That particular mantra has basically been part of the early modern era.

My paper "Greed is good, bad, and neutral" precisely breaks it down into this particular idea that greed is good because it enables economies to develop by harnessing people's individual innovations and group effort. Greed is bad when what is being extracted overpowers the things that are sustainable. When you look at Indian or European soils, we are looking at basically 1,400 years of continuous extraction and growth of urbanism.

In India, we are seeing the decline of small towns. Big cities are expanding to gargantuan unsustainable levels. Small towns are declining, and so people are

shuttling between villages and big cities. And this is something that has been developing for 500 years. We have come together to generate this system that is now a global phenomenon.

Even in the US now, as the population grows and its demands grow, small town farmers and the small towns themselves decline and most of the land is bought up by agricultural corporations, causing intense pressure on groundwater and land. This is essentially creating tremendous environmental problems.

Now, the question is, can we define greed as just this deontological process that exists without any context, or do we look at the consequence?

Most major religions view greed as something negative. Were there exceptions to this in not just religions, but also in philosophical schools?

Charvaka [a philosophical system of thought that emerged in ancient India emphasised materialism to understand and live in the world] had some different ideas. Just like the Hedonists in Greece at the same time, the idea that Charvaka evolved was that there is no such thing as *moksha* [liberation from the cycle of death and rebirth]. Charvaka negated the authority of the Vedas. Charvaka would say: Even if you go into debt, if your children have to pay your debts after you die, it is okay.

This was very different from Brahmanical Hinduism, where there was a push against the traders because they were thought to be greedy and parasitic. We use the term *kanjoos* to indicate their miserly nature. Trader communities like Marwadis or



A PARTICULAR BEHAVIOUR MIGHT SEEM GREEDY TO SOME, BUT IF THE CONSEQUENCES ARE NOT NEGATIVE, WOULD IT STILL BE GREED? IT MIGHT BE SEEN AS AMBITION, TOO

Chettiyars moved around and did not have a home base to stay and do their business. This made them the perfect outsiders, the scapegoats. You create this social causation narrative of the greedy person.

When did this sort of shift begin in the world, from looking at greed as something negative to something that is more complicated?

The shift actually took place at the same time, in the 16th and 17th centuries, both in India and in western Europe. The Islamic world, on the other hand, was very trade friendly. It was geared towards encouraging and protecting commerce through the legal system.

Until the 14th century, the centre of European

economic activity was the Mediterranean region, especially the Italian city-states. They were commerce-based. But in the 15th century, a shift takes place, where suddenly the centre of economic activity in Europe shifts to northwestern Europe, to Belgium and Holland, where traders were put in charge of charter cities (specific areas that are granted a special jurisdiction to create a new governance system). These were not new. Charter cities arose in the ninth century in Europe. In central Europe, they were institutionalised under what is called the Magdeburg law (gives the privilege of self-government). These were cities meant to protect commerce and commercial specialists from predation by political elites because traders are easy to go after. They have money.

You can imprison them. So these cities were built.

In India, we had the same kind of cities even two centuries earlier. The Nagarams and the Patnam were basically trade cities that were given by the Chola kings and the Chalukya kings to merchants so they would essentially build these cities. When the Islamic rule came to India, you did not really need charter cities to create commerce. Every city could be commercial because Islam was more commerce friendly.

But Europe saw a fight between religious elites, political elites and the economic elites. And it is around the 15th or 16th century that you actually start to see economic elites controlling vast amounts of capital because the shift from the Italian region to the Belgian region was the shift from commerce to finance. And finance is what trumps everything.



The shift was happening in India around the same time. There is a story from the Mughal Empire during the time of Akbar. The emperor's ships were blocked because the Portuguese barricaded the port of Surat. Akbar's mother was on the vessel, wanting to go to Mecca. The Mughals had their own sea admirals who were the Siddhis of Janjira. In the Mughal system, they can be the admirals of the Mughals, but they are also their own separate agents. So they had deals with the Portuguese. Even though they could have told them to shift, and the Portuguese would have listened, the Siddhis stayed out of the fight. They knew that

Akbar had no power on the sea to punish the Siddhis and the Siddhis could not be defeated because their fortress was impregnable.

Finally, a Hindu trader (whose name we do not know) came forward and he said, "I'll solve the impasse." He told the Portuguese, "If you let the ship go, I would adjust the interest rates and lower it by 1-2 per cent." He informed Akbar that the problem had been solved. In return, Akbar gave the merchant a lot of tax breaks. This was the first time in the history of the world that a trader actually solved an impasse that a grand Mughal could not. This is the time that you start to see the shift that is taking place almost concurrently in India, western Europe and everything in between, where the trader actually becomes a person who is not just economically powerful, but politically and socially as well. Suddenly people of trading families were being appointed to positions in the court. They were given charge of fiscal policies of the state in the Mughal Empire.

But the shift was not just in India. The world economy was unleashed. For whatever good or bad, it unleashed the early modern economy, where the state kind of took a step back and deregulated a lot of economic activity, gave tax breaks, legal protections, and so on. It unleashed so much activity, so much innovation.

Has greed evolved in the recent past?

In the late 1990s, Bill Gates was hated for making Microsoft Windows programme the default one on personal computers. In 2005-06, Gates was somebody who was accepted positively for his charity. We see a lot of elites in the West contribute to science. That idea of generosity is actually a very old anthropological concept, where you can gain social capital by giving it away. When you are seen as a generous person, you gain social capital. And so it is the opposite of greed.

One of the biggest problems with Indian business elites is that they are some of the least philanthropic people on the face of the planet. We wonder why universities do not do well. We have people who go to our universities, make lots of money and they never give back. We seem to be producing students who will move to the US. It is like the Indian outlook has not changed since the 16th and 17th centuries. **DTE**

GREED

KARLIJN HOYER

Greed scores are higher for the Chinese than the Dutch and the Americans. Why?

Is greed good, bad or complicated?

I am not completely negative about greed. I think it can be because the pro-greed people often argue that it is good for economic development. So, for example, greedy people in their greed tend to be very creative and develop new products, hire more people, and, therefore, they drive the economy. So, I think that greed can definitely be a motivator or something related to ambition, for example, and can drive people to just go a little bit further than they would normally go.

That is the positive side of greed. But if you are too greedy, then it becomes something negative, not only for society, but also for the person. We often see that greed is related to lower life satisfaction, for example. So, if you are too greedy, then this generally has negative consequences for yourself and for society.

What separates self-interest from greed?

Greed is an insatiable desire for more, and dissatisfaction with not having enough. So it is a twofold definition; on the one hand, the always wanting more part; and on the other hand, not being happy with what you have. Greed and self-interest are often intertwined because generally greedy behaviour is also self-interested behaviour, and the other way around. There are still subtle differences.

Self-interest is often a rational pursuit. So, people rationally want to strive for more and greed is not always rational. For example, always wanting more can lead to more consumer debt because you are so focused on getting more that you forget that

you actually do not have the money to spend. You keep on spending and then at some point you have this large consumer debt.

Studies suggest that greedy people typically engage in immoral behaviour or they are more likely to take bribes. Is the same sort of behaviour associated with self-interest as well?

Yes, we know from the literature that greed is associated with accepting bribes more often, and with unethical behaviour. Self-interest could also lead to such things. But in our study, "Greed: What is it Good for?", published in 2024, we found that self-interest had a positive relationship with relationship length. So people who are self-interested have longer relationships, while greed has a negative association with relationship length.

There is also a difference between greed and self-interest with regards to household income. Self-interest has a negative relationship while greed has a positive relationship with household income. Our results show that self-interest and greed are not the same.

Do some papers argue that greed and self-interest are the same?

Well there are some definitions of greed that include self-interest. But I think greed is an extreme form of self-interested behaviour. Philosophically, they are sometimes equated but empirically we can spot some differences. For example, if we look at the behavioural aspects in our studies, we see the



GREED IS AN EXTREME FORM OF SELF-INTERESTED BEHAVIOUR. PHILOSOPHICALLY, THE TWO ARE SOMETIMES EQUATED BUT EMPIRICALLY WE CAN SPOT DIFFERENCES

difference between greed and self-interest and their influence on household incomes.

Your 2024 study suggests greed correlates with household income and not with personal income. If greedy people are more ambitious and hardworking, how does it not translate into personal income?

We were a bit surprised about that as well because we expected a positive correlation between greed and personal income. If you would expect that greedy people are more motivated, they would get jobs that have higher incomes. We generally see that greedy people work in finance, for example, and then

income would be higher than those who work in education. But we did not find it. We think our results are a bit weird.

This could be the case because measurement of personal income also includes tax benefits from the government. So, it is not only salary. If you look at the subset of greedy people, there are studies that find that these people have a higher personal income. But we did not find this in our studies. That was much unexpected.

The positive correlation with household income could be because greedy people are just smart and they look for partners that have a higher income, and then together, they have a higher income as well. So, that could be a reason, but we could not disentangle that in our study.

Why do you think studies on correlation with personal income have produced mixed results? Is it because of different methodologies used or different populations that were surveyed?

I think, it is a methodological issue, like how do you define personal income? Who do you include? Do you include only people in the working force? It could also be a sample issue. But my hunch is it is a methodological issue.

Do you see a difference in how greed is viewed in different cultures?

There is not much cultural research on greed yet. We know that generally, if you look at the Chinese samples, for example, the greed scores are a bit higher than the Dutch and American ones, but we do not know why that is the case. It could be that it is more accepted in China, and so they have less socially desirable answers on the greed scale (self-reported), or it could be that it is culturally determined that Chinese people are just more greedy.

So we do not know that, but that is what the results show.

There is not much intercultural research yet. That is definitely something for future research. That could be interesting.

You also talk about greed being relatively correlated with the number of children.

On the one hand, you could expect that people, if they want more, that would also translate to

children, right? You also need a second person to get children and greedy people might not be the nicest people to have as partners because they are very focused on themselves and they are less involved with you, less empathic, for example.

And if you do not have partners, then the likelihood of having more children is also smaller. And that could be the reason why they do not have more children, even though they actually would have wanted it. That could be a mechanism, but we are not sure.



Is there a link between greed and other emotions such as envy, pride or gluttony?

Gluttony is very close to greed. It is like greed for food. You can say that it is some form of greed. There is a relationship between greed and envy. Even though greed can also be focused on you and envy always requires another person, still they are often related. There are some links there, I think. I believe there will be a paper out soon about greed and pride

IN ONE OF OUR STUDIES, WE SEE THAT IN MARKETS DOMINATED BY GREEDY PEOPLE, TRADERS HAVE LESS BUBBLES IN THEIR MARKET. THIS MEANS LESS MISPRICING AND MORE CLOSE TO FUNDAMENTAL VALUE TRADING

from a different laboratory. There is some research attention on the links between them but I do not think someone has correlated all of them yet.

There are reports suggesting that greedy traders triggered the 2008 financial crisis. What is your take?

In one of our studies, we see that in markets dominated by greedy people, traders have less bubbles in their market. This means less mispricing and more close to fundamental value trading. Why that is, we do not know yet. But it seems like, in this case, that greedy people act a little bit more rational. So that was a very interesting result.

These results were much unexpected because we know from the media that greed was always associated with the financial crisis. That was the narrative that was going on. The only thing is that greed can be experienced for everything. We did not know if greedy people were focused on getting more stocks in the market, or whether they were focused on making more money.

We have two sides in trading: the seller (trader) and the buyer. So, if prices are driven up, then the seller is very happy because he gets a lot of money. The buyer is less happy because he needs to pay a lot more.

Your study was done in the Netherlands. Do you expect to see something similar in other countries as well?

The only difference I envision is that, for example, as I said in China, people generally score a little bit higher on greed, so the market might be a bit higher. So the results might be even a bit stronger if you divide people into low- and high-grade markets. But I do not have a clear reason why I would expect differences between the countries because I think trading at stock markets is quite similar in countries.

If you get similar results in other countries suggesting that greedy people are less likely to engage in overpricing and mispricing, does that mean that we need to redefine greed as something that can be rational?

Our study was done in a very experimental setting. And so it is a lot different than real-life trading. We cannot generalise conclusions so easily. But if they hold true in other countries, one could even argue that we need to hire greedy people for financial markets because they result in less bubbles.

But I do think that in this case, it seems that greedy people act a little bit more rational. So greed is not necessarily irrational. It sometimes results in rational behaviour.

What are some of the major gaps in our understanding of greed?

One thing that distinguishes greed from materialism, for example, is that greed can be experienced for basically everything. So you can experience greed for sex, for partners, for food, for money, for cars. It is not only for material things and money, but also non-material things. And that is what I think is very interesting.

So, I currently have a paper on the review that looks at greed's link to social relationships like friendships. For example, how do greedy people treat their friendships and how do they feel about them? And one thing we find is that greedy people objectify their friendships more. So instead of thinking, "I have some free time, let me drink a beer with someone," they think, "I need to paint my house, who can help me?" They could be having very opportunistic friendships. And I think that is a big research gap because we know that greed leads to lower life satisfaction, but we do not know on which other fields in life it has a negative or positive effect. **DTE**



LUST

HELEN FISHER

Love, lust, attachments are basic brain circuits. They are too primitive a system and will never change

Humans experience love, lust, as well as attachments. How would you differentiate between the three?

I have figured out that we have evolved three basic drives for mating and reproduction: sex drive, feelings of intense romantic love, and feelings of deep attachment. Different brain systems run these three basic drives.

The sex drive is run largely by testosterone in both men and women. Romantic love, and we have proven this in brain study, is run largely by the dopamine system (dopamine is a monoamine neurotransmitter, which is also the chemical messenger, “communicating messages between nerve cells in brain and brain and the rest of the body”). The feelings of deep attachment are run by the oxytocin system (oxytocin is the hormone responsible for “key aspects of the female and male reproductive systems, including labour and delivery and lactation, as well as aspects of human behaviour”).

They have evolved for different reasons. The sex drive evolved to get people to look for partners. Romantic love enables you to focus your mating energy on just one person at a time. Feelings of deep attachment enable you to stick with this person at least long enough to have a child together and raise that child.

Being different systems, they have different feelings. Romantic love, for example, comes from the ventral tegmental area (structure in the midbrain involved in reward, consumption, learning, memory, and addiction behaviours) which is a tiny little factory near the very base of the brain. It spews out dopamine

and leads to craving, focus and motivation. The first thing that happens when you are madly in love with somebody is that the person takes on a special meaning for you. Everything about him/her becomes special. The car s/he drives is different from other cars in the parking lot. The street s/he lives on; the music s/he listens to; everything is special about him or her. You focus your attention on him/her. You can list what you do not like about him/her, but you just sweep that aside and just focus on the positives. You also experience mood swings into despair when things go poorly.

Real emotional dependence also occurs when you wait for them to send you a text, to give you a call, to invite you out. People experience separation anxiety and they do not like to be apart. When they do not call or write, you focus even more. There is high sex appeal, jealousy and possessiveness. There is intrusive thinking and it feels like there’s somebody camping in your head, and you are constantly thinking about that person. There is an intense motivation to win the person. To sum up, these three brain systems have evolved together to run our reproductive lives.

This means these drives contributed to the evolutionary success of humans?

In fact, the little factory that pumps out the dopamine and gives you that feeling of romantic love lies right next to the factory that orchestrates thirst and hunger. Thirst and hunger keep you alive. Romantic love drives you to form a partnership and send your DNA into future generations. It is a basic survival mechanism, not just an emotion. It’s a drive to find and love a certain person. They drive us to have babies



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WE HAVE EVOLVED THREE BASIC DRIVES FOR MATING AND REPRODUCTION: SEX DRIVE, FEELINGS OF INTENSE ROMANTIC LOVE, AND FEELINGS OF DEEP ATTACHMENT

so that our species survives. From a Darwinian perspective, if you have four children and I have no children, you live on, and I die out. So these brain systems evolved to enable us to have sex with a group of people, figure out who we fall in love with, form a marriage or a partnership, and have babies and send our DNA into tomorrow.

The human brain has been around for 300,000 years. But we came down from trees—from our ape ancestors—about 4 million years ago. And these brain systems evolved to pass our DNA into the future.

In animals, all kinds of foxes and wolves form a partnership; they form a pair bond and send their DNA into the future. What is unusual about humanity is that we bother to pair up; our closest relatives,

chimpanzees, do not. A female chimpanzee experiences romantic attraction. But that does not last long, and she does not form a long-term partnership. And the reason she does not is she does not have to. She can put the baby on her back; continue to feed herself; she can race into the trees; and protect herself. She does not need a partner to raise her babies. Elephants form a courtship for about five days, and then it is over.

Only 3 per cent of mammals, including humans, pair up. The reason is when we came down out from the trees, we had to begin to stand up on two feet to carry food and weapons in our arms. And how are you going to carry the equivalent of a 20-pound baby in one arm, and sticks and stones in the other arm and

protect and feed ourselves? So females began to need to have a partner to help protect and provide for them. And males could not provide for a whole harem of females, but could provide for one. And so we evolved a drive to form real partnerships.

Now, the pairing need not necessarily last forever. Most of us have had more than one relationship and a lot of people have had more than one marriage, but we do form pair bonds. The bottom line is that we are a pair-bonding animal. We do tend to have a series of partnerships, kind of a serial monogamy. And I often wonder if you have a relationship with one person and two children, why do you break up and form a new



partnership with somebody else and have another child? What you are really doing is creating children of more genetic variety. And for millions of years, that was adaptive. So we tend to marry, divorce, remarry, have a series of partnerships, probably for a Darwinian reason of having babies by more than one person.

In our ancient hunter-gathering societies, people tended to have about three marriages during the course of their lives. Then they settled down on the farm where they really could not leave. You cannot dig up half of the field and move out to other destinations—you are stuck. So we evolved this belief that marriage should be for life. And of course, in a modern world where most people are not on the farm, people are free to have more than one partnership. I

am not advocating it. Divorce is very complicated and very painful, but I am not surprised that people do tend to have a series of partnerships. It is not only because they are unhappy in the relationship, but because, from a Darwinian perspective, it has been an evolutionary adaptation for millions of years.

Has the idea of love changed over the years?

Basically, love has not changed. This is a brain system, like the anger, joy and the fear systems. It is too primitive a system. It will never change. It is just a basic brain circuit. But courtship has changed, and how you find a partner has changed. Millions of years ago, they met at a waterhole on the grasslands of Africa and then started going out. A thousand years ago, in the farming age, people met at a dance and were introduced to people by relatives. And today, until these dating apps came along, people met at college, at work, or through friends.

And today, actually in America, a lot of people meet on the internet. I study American singles because I am chief science advisor to a dating site. I would not like to call them dating sites. They are introducing sites. And what is interesting is the newest thing—video chatting. In 2015, only 6 per cent of singles were using video chatting before the first date. In 2020, some 19 per cent did. And today in America, one in four people meet on the internet through video chatting before the first date and 37 per cent are willing to do it. And it is a great way to save time and money. You can just talk to somebody over the internet and it is a great way to vet somebody, to decide whether you want to go out with the person.

Love is typically seen as a cocktail of chemicals. Is there more to it?

People are selective. You are not going to fall in love with everybody, say, just because culture is involved. We develop what I call a love map, which is a list of things that you are looking for in a partner. And most of us do not find all of them, but we find somebody with enough of those characteristics. Bingo, then the brain triggers the romantic love system—the dopamine system—and you fall in love. **DTE**

LUST

XIAOMENG XU

Earlier, people assumed if you are romantically interested in someone, you are also sexually attracted to them. But that is not the case

Religion has looked at lust as a sin. What is the scientific view on it?

I think, for a long time, people just assumed, if you are romantically interested in someone, you are also sexually interested in them, and they just kind of go hand in hand. But that is not the case.

For example, some people might find someone sexual attractive, but not have deeper emotions with them. Then there are folks who fall in love, but may not have a lot of sexual desire, and that can change over time. A lot of people might experience quite high levels of sexual attraction in the beginning, which may modulate over time and commitment might start very low, but might increase over time.

A lot of it also has to do with how the relationship starts. Were you strangers in the beginning? Did you know each other for many years before you started dating? And then the pace at which things change. So, if you are learning about another person and getting close to them very quickly, that feels very intense, usually. And so people, typically, enjoy that kind of intense feeling. But some folks like the pace to be much slower and more gradual.

Lust can become problematic from a societal or legal standpoint. If you are lusting after someone in a way that is harmful to them or to you, that is not great. But oftentimes, what researchers look at is when it is problematic to yourself. If lust is interfering

with your day-to-day life, then it becomes problematic. Seeing a therapist can help. Having clear communication with your partner can also be effective.

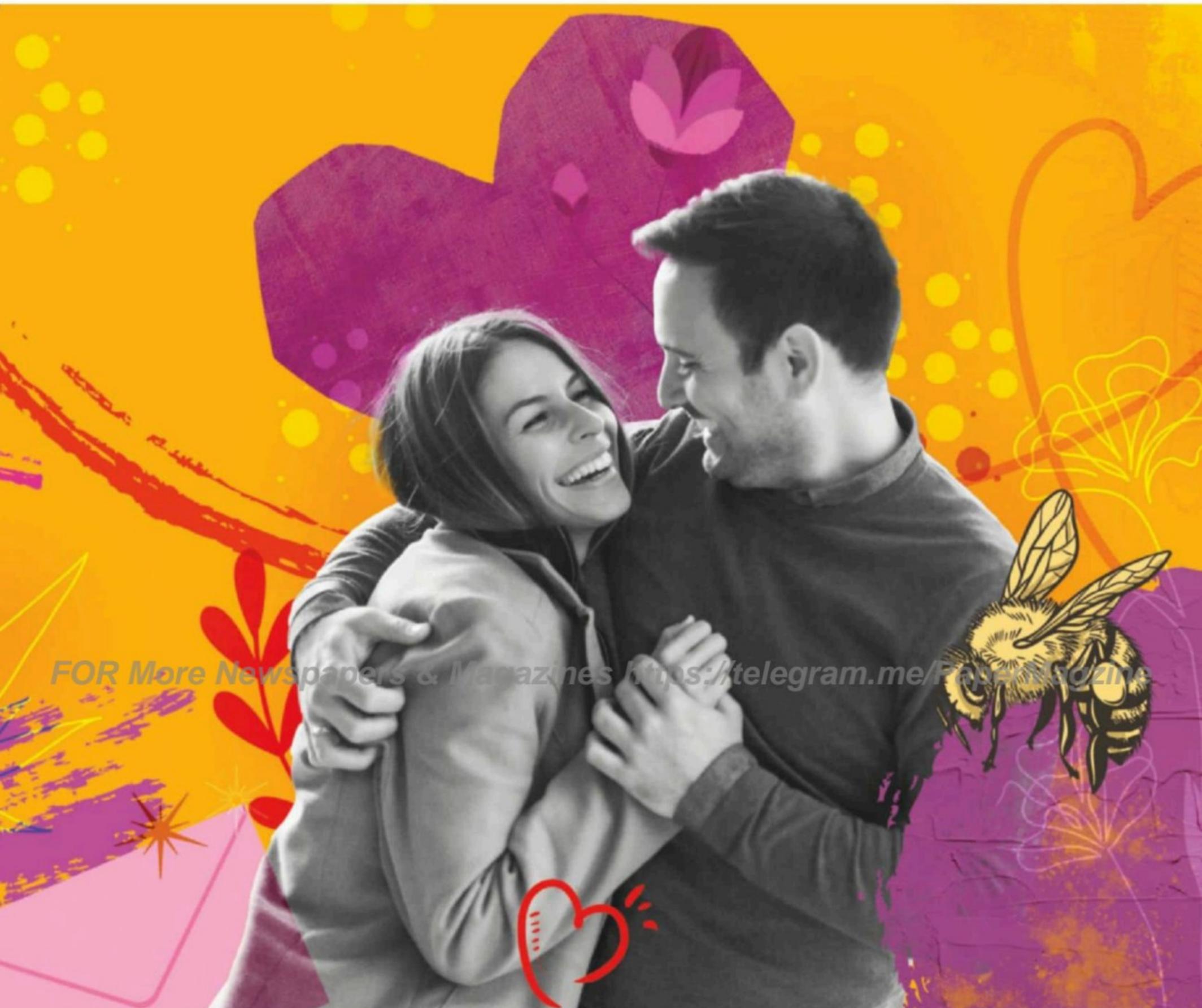
Why have we started studying love? Do we need to?

Love has been scientifically studied since the 1950s. Though there is substantial literature, it is fairly new compared to some other fields and within psychology as well. It is so interesting because of how much it impacts people. It is such an important part of people's lives. Whether it is the relationships they are in or they want to be in. It can affect so much of people's emotions and also their health. There is a substantial amount of literature on how impactful close relationships, romantic or otherwise, are on health, disease prognosis, quality of life, and even death.

It is really fascinating to study love using different methodologies. We ask people about love, interview them, put people on scanners and study their brain when people are looking at pictures of their partner versus other people. Science is very experientially based. At the end of the day, it tells us the trends on what leads to healthier relationships, for example.

The success of relationships could depend on variables like commitment or trust, or is it because of person A or B or the dynamics? Or is it because of other factors, like time or family or other influences?

CALLING LOVE AN EMOTION IS TOO SIMPLISTIC BECAUSE LOVE CAN PROMPT SO MANY EMOTIONS LIKE JOY, SADNESS OR ANGER, DEPENDING ON THE CONTEXT



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So trying to parse that apart and look at it almost like a mathematical model of what is contributing to the relationship outcome can be really challenging. This is further complicated by the fact that everyone, based on experiences and media exposure, come with preconceived notions of what relationships need to be.

In the last decade or two, we have started to see a lot of research progress on relationships. For a long time, research focused on heterosexual couples, predominantly white couples, especially in the US.

There has been quite a good push to expand that. We need more research in terms of diversity of types of relationships and the people in them. We have seen a huge expansion of that kind of research in the last decade or two, which has been incredibly exciting.

Do we understand what love is in the psychological context?

There is a debate around this. I can share my understanding and definition of it, but others would

disagree with me. That is good because that is how we know we have a healthy science.

I study romantic love, predominantly early-stage intense, passionate love. I belong more to the camp of scientists defining love as a motivated goal state, where you desire union with another person. That may or may not include sexual components. But the idea is that you are very focused on at least one person. And it could be more than one. There is this motivated drive for you to spend time with them, get to know them, and start to include them and their identity into your own sense of self, and vice versa. This is someone that you want to merge with in a way,



including your identities and perspectives.

There are other ways to look at love. One of the earliest ways to look at it is to say that it is an emotion. And, I think, there are some good, compelling reasons to think of it that way, predominantly because if you just ask people what love is, that is probably the first thing they will say. But, I think, that is too simplistic because love can prompt so many emotions like joy, sadness or anger, depending on the context. Also, we often think about emotions, in terms of things like facial expressions. Basic emotions tend to be associated with specific facial expressions; but

there is none for love. Also, when we talk about regulation, we can regulate emotions, like anger, up and down. It is harder to regulate love. If I told you to look at someone next to you and get really angry at them, you could probably do it if you tried. But falling in love with a stranger right away is much harder. So those are some of the pieces of evidence to suggest that love is more than just a basic emotion. And it has that motivational component and it has all these additional interpersonal components as well.

You studied people's brains when they saw their partner's picture. Could you elaborate on what you saw?

One thing to keep in mind is that every individual's scan is going to look a little different. But if you look at people's overall brain activity while they are looking at a picture of their partner and thinking about them, compared to someone they do not have those special feelings for, you see differences in the mesolimbic dopamine system. This is a system that is very much involved in reward and motivation, and also learning. Some of the areas, like the ventral tegmental area (located in the midbrain controls diverse behavioural repertoire, including reward processing, aversion, stress modulation, drug addiction, learning, and memory) and the nucleus accumbens (plays an important role in motivation and reward processing) are also activated. Interestingly, these are also implicated in drugs of abuse. So this is evidence to a common phrase that "love is like a drug".

But there are also studies on people who have been in relationships for an average of 20 years. One study recorded reward system activations among people in long relationships. But what is interesting is for those folks, they also have activations in the serotonin-rich areas, which is a potential explanation or a mechanism for why long-term healthy and happy relationships can be helpful for mental health and reduced chances of depression. So, for these longer-term relationships, we see activations in reward regions as well as in attachment regions, suggesting they have built a relationship with and have trusted their partner for a long time. **DTE**

ENVY

JENS LANGE

Envy gives people a fundamental desire for a higher social rank

Is envy more psychological than social?

Being envious is frowned upon. It is considered a deadly sin. It is probably a very common experience, but most people deny experiencing it and insult those who do. And this is a very interesting dynamic.

It makes sense to investigate envy because it stems from a social comparison with another person. It speaks to people's desire for a higher social rank. Both these processes are fundamental psychological processes in humans. There is evidence showing that people automatically compare themselves to others. If you want to say that you are smart or nice, you do that by comparing yourself to other people in a community, group, culture or other reference group.

Given that envy is a common experience, have humans benefited from it?

Typically, most people would describe envy as evil, especially in the Christian tradition, where it is part of the deadly sins. This kind of thinking is deeply ingrained in people, that they should not experience envy. But from a psychological perspective, we tend not to judge. We look at emotions as something functional to help people deal with situations.

For envy, there is evidence that it is elicited when people are lower ranked compared to another person ranked higher. Envy gives people a fundamental



desire for a higher social rank. Consequently, people activate certain reactions that help them level that difference. From that functional perspective, envy has a certain value.

So, if envy has value, then it is not bad, right? But philosophers have a different view. They ask if it is good for society. When people are envious, certain things that they do to deal with a situation of being lower ranked could hurt others in a society. For instance, envy may motivate you to do things that are bad for society in general or even, maybe, bad for yourself. In that sense, envy may not be valuable. This means that to a certain extent, envy is reasonable. People should not avoid experiencing it because it helps them deal with situations of high relevance. But then envy can lead to certain reactions that are, at least from a moral standpoint, not valuable.

There is already some evidence that when people compare themselves with others over certain physical characteristics that they want to strive for, then envy may motivate people to consume diet pills or go on certain nutritional diets, which can be bad for a person.

However, none of the emotions is guaranteed to always make society better off. For instance, in psychology, often the reasoning is that people had to deal with certain situations in the past, which are



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IF ENVY HAS VALUE, THEN IT IS NOT BAD, RIGHT? BUT PHILOSOPHERS HAVE A DIFFERENT VIEW. THEY ASK IF IT IS GOOD FOR SOCIETY

relevant to their personal needs and desires. There is a large body of evidence supporting the conclusion that people have a fundamental desire for social rank. It also makes perfect sense because being high up in a hierarchy has various benefits. You have access to valuable resources, like material advantages and social support. It comes with better health conditions, longevity and so on.

This is a very plausible mechanism that would help you transmit your genes. But, then, these evolutionary explanations are always difficult to make. I mean, it is a very reasonable story, but I cannot travel back in time and test whether this works. We only have evidence that signals of higher social rank intensify envious reactions to gain a social rank.

One reason behind the success of the human race was cooperation. How does envy, which encourages competition, interact with it?

I think, envy primarily is relevant in competitive situations and there is no way to avoid competition. Certain resources are limited. In an evolutionary sense, not everyone can have all the things they want.

We study how people deal with the situation of being lower ranked. Namely, we often compare what is called benign envy and malicious envy. If you are compared to someone higher ranked than you, then you can either try to become as highly ranked as the other person, for instance, by investing more effort, which is called benign envy, or you can try to harm the superior person's position, which is called malicious envy.

Evidence indicates that benign envy occurs especially in situations in which social rank is distributed according to prestige strategy. So, people try to achieve a certain social rank to be respected. They might also gain influence partly by sharing their skills and knowledge with others. So, some people

are highly ranked and are willing to tell you how to become equally successful to improve society's overall value. In that sense, it could be interpreted as a form of cooperation, right?

But then there are exceptions. Certain groups may cooperate and foster envious reactions for goals that may not necessarily be reasonable. An example that my philosopher friend uses is, if you are benignly envious of a very successful torturer, and the torturers operate such that everyone becomes very good at torturing others, that is not necessarily morally valuable.

When did this distinction between the two forms of envy—benign and malicious—emerge? What triggers benign envy or malicious envy, and can one individual experience both?

It has been discussed in various forms since the 1990s. There is one particular paper published in 2009 from the Netherlands, where they introduced these terms. Since then, it has been heavily investigated in various other papers.

As for when people experience a particular form of envy over the other, most research on emotions argues that they result from people's evaluations of situations, which are called appraisals or automatic evaluations. You can imagine that people are constantly asking questions about situations, and depending on how they answer them, they will experience different emotions. There is evidence indicating that benign envy results mostly from people experiencing a high desire to change their situation for the better, whereas malicious envy occurs mostly when people evaluate the other's higher social rank as subjectively undeserved.

So, for instance, when this person shows a higher rank, because they were the teacher's favourite in school, or have rich parents, or just have better genes, I consider the rank of my competitor to be subjectively undeserved. If people tend to make these kinds of appraisals and evaluations of a situation more frequently, then they are also more likely to experience either of these two forms of envy.

For example, certain people with high levels of

narcissism are more likely to experience malicious envy. They think others do not appreciate their brilliance, and so they have to aggressively put them down. They are more likely to evaluate others' advantages as undeserved and then experience more malicious envy.

To answer the second part of your question, in each situation, I can experience either of these or both at the same time, or none of these. Very likely, it happens within the same person, but not necessarily in the same situation. But each person can experience both; depending on their personality, one of them may be more frequent than the other.

But this is in the land of speculation. So, there is no evidence to support this claim, but I personally always find it plausible that this can also evolve as a sequence. So, initially it makes perfect sense if you try to improve your own situation of being lower ranked. If that does not work, one might switch to malicious envy.

What are some of the gaps in our understanding of envy?

Two gaps come to my mind. On a general level, we know how envy interactions unfold. We know that if there is a comparison in terms of social rank, then people may invest more effort into actual behaviour, or invest in harming behaviour. But does this translate into some benefits to the person experiencing envy? There is not so much evidence on this.

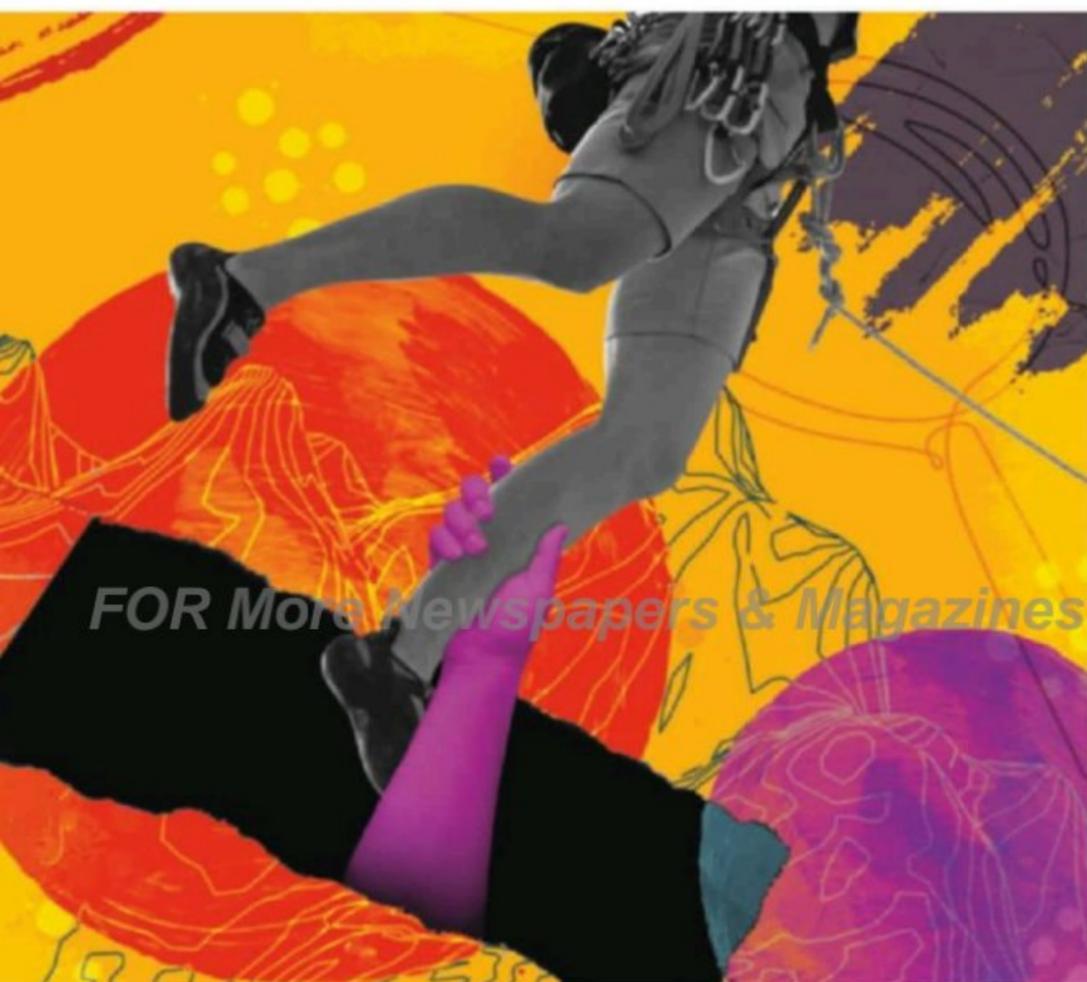
Second, there is a very limited understanding of cross-cultural differences. It is very reasonable to predict that between different cultures, different things will elicit envy. An interesting pattern is that some languages have different words that refer to benign and malicious envy. In other cultures, they do not. Does that make a difference, for instance? What about different religious backgrounds? There is a long tradition in Christianity to discard envious feelings, but probably in other religions, it is not so much. And is this kind of cultural variation also predictive of envy unfolding differently or being more prevalent? We are yet to understand them. DTE



ENVY

ANDREW OSWALD

A high level of envy is not predictive of doing well financially in the future, but it is a strong predictor of doing worse in terms of mental well-being



envy must be diminished to make a nation happier. The evidence we have got, consistent with a lot of common sense, is that envy is a kind of corrosive emotion that eats away at people. It probably does not have many benefits and comes with a lot of costs.

My own view is that many of the institutions we see in the modern world, as you do in India and I do in mine, probably exacerbate envy. This is a problem for society. It would be better to have institutions that reduce envy and comparisons with others.

Your research talks about the modern society developing institutions such as social media and advertising that make people feel inadequate and envious of others. Since when have you started seeing this trend?

In some of my works, I have documented evidence that shows that rise in advertising has been followed by declines in happiness later. The whole point of the vast advertising industry in the world is to make you feel inadequate. Advertisers are not in the business to make people feel happier immediately because if we were all content, we would not be buying the stuff they want to sell.

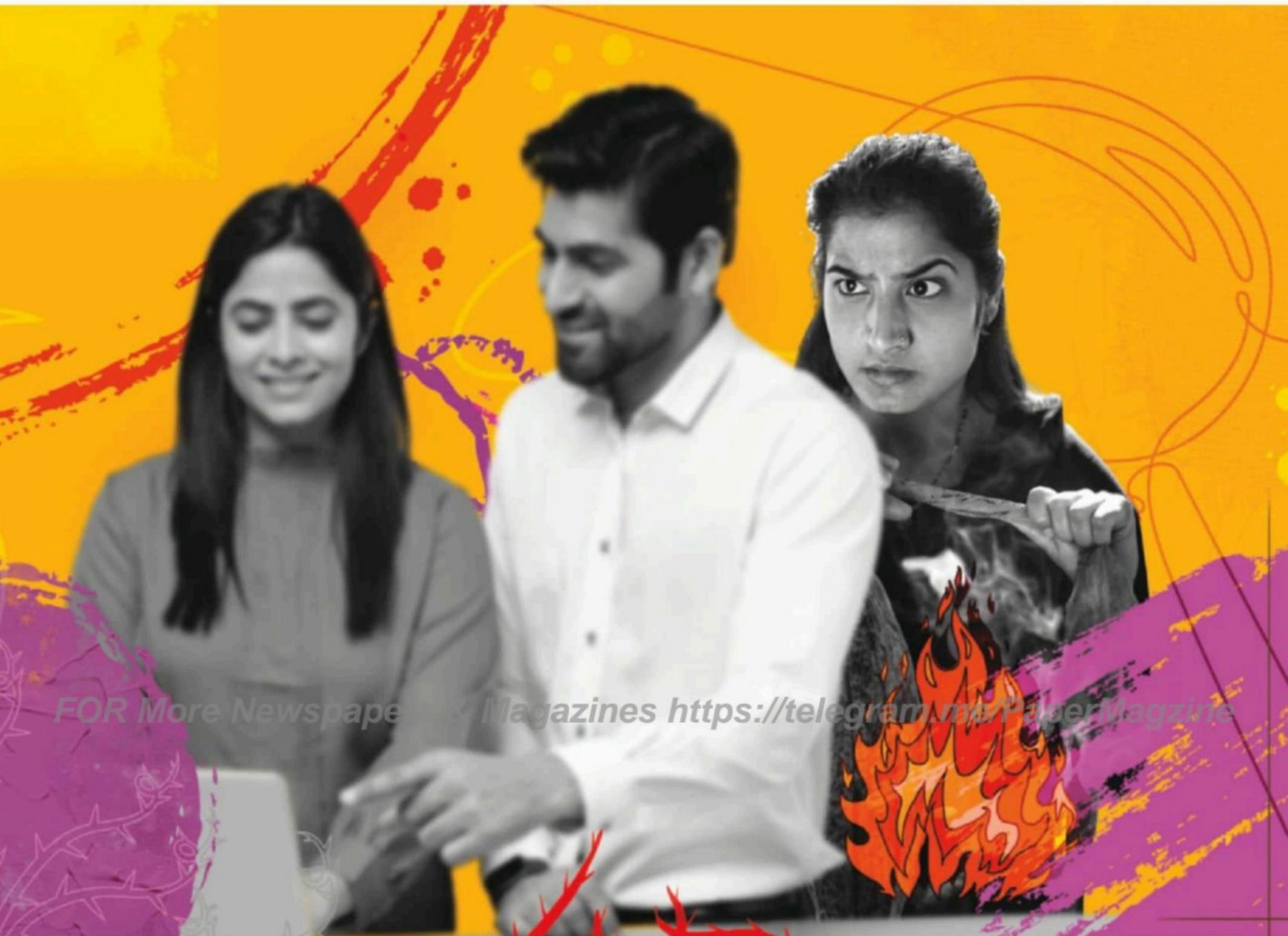
Therefore, I view advertising as a bad thing, and think we should ban advertising for anything costing more than US\$ 10, for example. I do not think it matters too much for advertising butter or grapes. But it is relevant for motor cars, fashion. Probably these have social costs, in my view.

Is envy innate to humans?

I guess, it is innate. We want high economical and social status. We see comparisons all around us in the human world, and it is easy to believe that it is innate. One might hypothesise that it comes from the animal world in a broad sense, where different kinds of animals have to struggle to be high up in the status ranking to get mates, resources and so on.

I would view it as very natural, possibly not the most admirable of human emotions. We, no doubt, share this with chimpanzees and orangutans and probably lots of other kinds of animals.

I think, it is important to study envy because it is a basic human emotion. And it has policy implications as well. Bertrand Russell, a British philosopher, said



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IT IS A SCIENTIFIC POSSIBILITY THAT ENVY IS VALUABLE BECAUSE IT ENCOURAGES PEOPLE TO WORK HARDER. BUT WE COULD NOT FIND ANY EVIDENCE FOR THAT IN OUR DATA

What about arguments that envy and advertising could drive the market?

Advertisers are in the business of saying advertising is an excellent thing because we are showing the consumers how much better our automobile is, our fashion jacket is and so on. By and large, I do not believe that. And a lot of modern things that are advertised do not seem very much different from the other items being advertised by the rival automobile companies and so on.

I think, it is much more a status race that they are engendering, rather than a kind of increase in

information in a genuinely valuable way to consumers.

There are arguments that competition driven by envy could motivate people to work harder or achieve bigger things in life.

Yes, that is a sensible hypothesis to think about. It is a scientific possibility that envy is valuable because it encourages people to work harder. But we could not find any evidence for that in our data. We follow through time nearly 20,000 adults and we

measure their envy at different life stages. Then we can measure if their income rises. Later on, we can compare the envious people with the non-envious people.

We find that a high level of envy is not predictive of doing well financially in the future. But it is a strong predictor of doing worse in terms of mental well-being.

I do view it as a scientific possibility that envy has a valuable role by stimulating effort. But I cannot find any evidence in our data for that. I do not know of any real evidence. I would be open to evidence, but I have not seen it.

Like envy, competitiveness is a natural human emotion. At work, I have observed my colleagues over my lifetime. They work hard and I work hard. I am part of the competition as a researcher. I have been in universities all over the world and have seen very talented people. Being aware of competition and working hard is not the same as being envious.

Why do you think envy does not work?

I suspect because it is a sort of residual emotion, and it goes along with a kind of disappointment. So it seems to me that the envy comes at the end after experiencing failure, leading to resentment.

So, perhaps, it is too late in a way to be a motivator. These competitive emotions are needed at the beginning of everything so that they produce greater effort. Envy, I believe, is what is left at the end. It reduces the happiness of the envier and probably it provokes bad behaviour that reduces the happiness of people around the envious individual as well.

Does envy lead to hate?

We see that very extreme envy could look like a form of hate. I think that would be unnatural. In our data, about 1 per cent of people put themselves in the top envy category. Everyone is asked: Would you view yourself as an envious person? And they are asked to give a number from one to seven, where seven is the most envious. Half the people give a score of one or a two, but one per cent of the population put themselves in the extremely envious category.

Even then, I am hoping that most of those people do not hate anyone for it. I would think, in general, that is too extreme a connection. The world is full of envy, we know that, but thank goodness there is not too much hate that is connected with envy. Unfortunately, a lot of hate, when we look at the world in 2024, is connected to territory and religion, and to ethnic differences and so on, but not envy as commonly defined.

So why does envy exist if there are no benefits?

This is an important scientific question. I do not know the answer to that question. But I cannot find any evidence that envy has a good side. When we began our project, we had an open mind. You know, we did not have an axe to grind; we did not know how the numbers would come out. I suppose because my PhD is in economics, I am hard-hearted because of my training and I thought there must be a good side to this thing. Especially thinking of it as a motivator to work harder. But I am pessimistic about the value of envy because I do not see the evidence.

What are the other gaps in our understanding of envy and the consequences or the impacts it has on people and the society at large?

I would say the scientific gaps are still considerable and I would very much like to see them filled in my lifetime.

Perhaps the most fundamental one is: What is it that causes some people to be highly envious and not others? Is it something dramatic that has happened in their childhood? Are there different genetic components for envy? Has something happened to them in their workplace? Have they seen something in their parents? Is it something to do with the culture and religion in which they have been brought up? That seems important.

Again, going back to Bertrand Russell, if envy causes a huge psychological penalty to a whole society, then we need to think about how to reduce it. But that is just shorthand for what caused it in the first place. If we are going to reverse something, we need to know the cause. **DTE**



GLUTTONY

WILLIAM B IRVINE

We have been captured by food and it is driving us to do something that is arguably not good for us

How has the world's view on gluttony changed over the years?

Views on gluttony have changed dramatically. If you go back 500 years, when the church, at least in the western world, played a dominant role, then gluttony is one of the seven sins. The church said that you might enjoy being a glutton while you are alive, but when you are dead, you will be punished. We have these paintings of gluttons in the depths of hell being consumed by other creatures. This was during a time when most people could not be gluttonous for the simple reason that they faced shortage of food.

If you go back in the eastern world, the Buddha experimented with this and tried to put himself on a very minimal diet. And in the end, he drew the conclusion that the proper thing to do is not eat too much, not too little—just the right amount.

If you go back far enough, to the savannas of Africa, people lived a day-to-day existence. You did not have a refrigerator, you could not even store food because you would have to carry it by hand to wherever you were going. So, whenever there were opportunities and when food was there, you ate a lot with the expectation that it was going to be a long stretch before you got access to food again.

But, of course, we have transformed into this incredible world where you can get what you want, whenever you want, and in abundance. However, there are still places where starvation is a problem.

Someone living on a really low income can also be a glutton. They tend to focus their attention on

highly processed foods. They are going to find things that are cheap and eat a whole bunch of those because that momentary pleasure of eating that tasted good.

The fact is that food keeps you alive, gives you the energy to go through another day of life. Food tastes so good and some people can get carried away by that. They get seduced by that. It is also one of the ways of leading a good life. But the secondary consequence of that is people gaining weight.

Now, we do not want to be judgmental of people. But, I think, gluttony drives you to eat. We have been captured by food and it is driving us to do something that is arguably not good for us.

What are your thoughts on the role of the food industry in changing the view on gluttony?

You can make a lot of money off people's gluttony. You can keep them eating your product. You can entice them to buy and consume your product by making it sweet and fattening. When I was young, we had minimal access to processed food. This would have been in the 1960s. There was one cereal called Captain Crunch, which was really crunchy and high on sugar. My mother brought home a box of it. And I remember over the course of one weekend, I consumed the whole box because it was just like candy. This can become an important part of your daily diet so much so that people could eat it as a snack.

So, producers might say that as long as people are perfectly happy to buy our product, we are going



CLASSICAL PHILOSOPHY SAID THAT FOOD CAN BE ABUSED. YOU CAN EAT TOO MUCH AND FOR THE WRONG REASONS. IF YOU DO THAT, YOU HAVE GIVEN UP CONTROL OVER YOURSELF

to do what it takes to seduce them, in a gastronomical sense, to want and buy this product. So, they are driven by that. And then if you look at the healthy food options, they want people to buy their product, too. But it does not have the same effect. They cannot just take a carrot and add sugar and fat to it. It does not work that way. So, they are limited in what they can do. But if they could, probably, they would.

In a chapter authored by you in the book *Obesity Prevention* you argue that gluttony is the root cause of obesity. There are studies that link obesity or binge eating to other

factors like genetic disposition, sedentary lifestyle or loneliness. What are your thoughts on that?

I would argue that we have two epidemics going on simultaneously. The obesity epidemic, which is a very well measured and documented state, and the other thing is what I would call the gluttony epidemic. I also believe you can have one without the other.

But I would like to suggest that in the US, gluttony is the root cause of obesity. People have access to food, and that is good. You could have access to food and still practice some self-restraint from consuming something that is sweet and fattening. So, gluttony is the cause of the obesity

epidemic. So, I would make that claim. If you ask me why people make eating fattening foods such a key part of their lives, I do not have an answer.

You also talk about a lack of philosopher's perspective on gluttony in a research paper. Why is this important?

Philosophers can provide a different viewpoint. Doctors, I do not think, use the term gluttony. And in modern times, philosophers have almost no interest in gluttony. In that paper, I looked up a philosophical index on how many papers have been written about gluttony. There were only three. So, it is something that we do not talk about, and is left for religion. Modern philosophers have very little interest in talking about it.

It is not a good idea to allow something to control your life. There are a number of things that can take control of your life. Examples include short-term fear, sexual appetite and appetite for food or drugs.

As a rational being, you should want to be in control. You should want to be at the steering wheel. If you go back into classical philosophy, you can find

in all the different philosophy schools, people have said that food can be abused. You can eat too much and for the wrong reasons. And if you do that, you have given up control over yourself.

Given the similarities between greed and gluttony, are the two closely linked?

One can be greedy about a number of things. But gluttony is specific since it involves food, and maybe, drinks as well. A glutton could be greedy. They would be somebody who had a lot of food and they would not want anyone else to have it because it would upset them, even though they had more food than any human could sensibly need. The two terms are close, but a different concept.

There are also papers on energy gluttony. How is this different from gluttony?

It is used to describe people who use more energy than is needed. In the US, there are these giant pickup trucks that consume a lot of energy.

They use energy to an extreme level, in part, to display their use of energy. The thing between energy and food gluttons is that you hurt yourself with the latter by increasing your risk for other diseases. I mean, if you are on public health insurance, I imagine you hurt the public as well, and you hurt your family as well.

But an energy glutton is hurting the environment by contributing to climate change. So, why do they do that? I guess they enjoy it. So, it is one of these things that are pleasant, but come with bad consequences for the people around.

Another difference is that food gluttons may feel good at first and then later start feeling bad when they gain weight. For energy gluttony, I guess, it is a little bit harder to explain because it might feel good to go around in a car with a big carbon footprint, it might be part of their personal identity, and they might be getting some kind of kick. **DTE**





GLUTTONY

NATHAN H LENTS

Our metabolism is engineered to zealously store any excess calories as fat and resist attempts to lose weight. This comes from our history of feast-or-famine lifestyle

Did gluttony help in the evolutionary success of humans?

Yes. I think we have more than enough evidence to conclude that gluttony is innate in humans. Firstly, we see a voracious appetite in many other animals. It is not a uniquely human problem. Since access to calories is often a limiting factor for survival, many animals have a constant drive to seek and consume food, and most animals have an appetite for the most calorie-dense foods they can access. We have to manage the calorie intake of animals that we care for in our homes, farms and zoos. If we provide unlimited access to preferred foods, many of them will become obese. Secondly, our metabolisms are engineered to zealously store any excess calories as fat and resist attempts to lose weight. This comes from our history of feast-or-famine lifestyle.

Are gluttony and greed linked? Are greedy people typically gluttons?

No. I do not see greed and gluttony as biologically linked. Greed is tied to the acquisition of material resources for the purpose of power and social dominance. Greed is a psychosocial phenomenon, whereas gluttony is, mostly, a biochemical one.

The idea that low physical activity is chiefly responsible for the obesity epidemic has fallen out of favour. Why?

Because studies have shown that, one, physical activity alone is ineffective as a means of losing weight, and, two, the degree of physical activity alone is a poor



indicator of body mass index (or BMI, a measure of body fat based on one's height and weight) or obesity. In both cases, the diet is a better predictor. For many, it is easier to lose weight through dietary changes alone, at least at first. And BMI is much better predicted by your diet than by your level of physical activity.

Is gluttony behind the increased rates of obesity? What about genetic predisposition and the studies linking loneliness with binge eating?

Gluttony plays a role because humans have a powerful appetite for calorie-dense foods. The way that behavioural drives work is through brain chemistry. Any time we satisfy a drive, we get a boost of dopamine in our reward centre, which reinforces the behaviour and trains us to keep seeking it. Addiction works the same way, but even simple things, like a cold glass of



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WE NOW UNDERSTAND OVEREATING AND OBESITY AS ISSUES THAT ARE MUCH MORE COMPLEX THAN A SIMPLE MATTER OF WILL POWER

water on a hot day, can tickle our reward centre.

Going further, individuals who are starving for dopamine because of loneliness, under stimulation, can experience a stronger desire for the things that give them some psychological relief. This is why most psychologists agree that chronic overeating is often associated with underlying psychological issues that should be explored in counselling.

Do you think the term gluttony is falling out of favour in recent times?

I agree that you do not see the word gluttony as much as you used to. In historically Christian countries, this may be due to the association of gluttony with sin. In the Catholic tradition, gluttony is one of the seven deadly sins. Talking about sin has fallen out of fashion in modern society since the role of religion has been reduced. Moreover, we now understand overeating and obesity as issues that are much more complex than

a simple matter of will power. These are metabolic issues more than they are free choices.

Are there any positives to gluttony?

We all enjoy nice food and drink, but gluttony and overindulgence are major health problems, not just for us as individuals but for society. The way we eat and produce food is not even close to being sustainable. The land and resources needed to produce rich meats and animal products is far more than what is required for healthier foods. That is yet another reason to make healthy food choices of fresh fruits and vegetables.

What are the gaps in our understanding of gluttony?

We understand why humans are driven to consume calorie-rich foods, but we are still figuring out what the “optimal diet” for humans is. That is one of the biggest challenges in health and wellness. **DTE**



RESIDENTIAL TRAINING ON WATER EFFICIENCY AND CONSERVATION (WEC) IN URBAN INDIA



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Water efficiency and conservation (WEC) are crucial for sustainable urban water management in India, where increasing population and changing land-use patterns challenge freshwater resources. The complex urban water cycle, influenced by surface runoff and piped-water systems, underscores the need to prioritize conservation of local sources like groundwater and waterbodies, often overexploited and neglected. WEC strategies involve optimizing resources, minimizing waste, and promoting sustainable practices, aligning with SDGs. In 2019, the Centre for Science and Environment (CSE) released a policy paper and guide on WEC for the Ministry of Housing and Urban Affairs. Building on this, CSE is organizing a three-day residential training program on Water Efficiency and Conservation in Urban India, aimed at equipping participants with the knowledge to engage effectively with WEC projects for resilient water supplies in cities.

AIM

This comprehensive training program aims to educate participants on advanced aspects of Water Efficiency and Conservation planning and implementation, equipping them with the knowledge and skills essential for excelling in water resource management.

OBJECTIVES

- To sensitize practitioners to the crucial need for Water Efficiency and Conservation (WEC) and to impart a deep understanding of its concepts.
- To provide participants with a structured approach to WEC planning at various scales.
- To equip participants with an in-depth understanding of tools and methodologies used for assessing and measuring WEC.
- To facilitate learning on existing policies, guidelines, and best management practices related to water efficiency and conservation.

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 They only need to make their
 transportation arrangement to and
 from the CSE Head Office, New Delhi.*



TARGET AUDIENCE

City officials from urban local bodies (ULBs) and development authorities such as urban planners, town planning officers, engineers, those involved in preparing and enforcing WEC plans at the city/ zonal level and developing and implementing local WEC strategies.

TRAINING METHODOLOGY

The training methodology will follow a mixed approach involving lectures, group exercises, interactive discussions, video documentaries etc.

*(nomination will be accepted on first come first serve basis due to limited seats)

FOR MORE INFORMATION, KINDLY CONTACT:

TRAINING COORDINATOR

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WRATH

AARON SELL

Anger is an emotional programme, a part of natural selection that helps us bargain for better treatment

Is it important to understand anger?

A good friend of mine was the victim of a very violent crime. I experienced anger at the time. But, in retrospect, I think, it was hatred, which are somewhat different emotions. So, that is what got me started on that particular topic.

The reason that anger should be well understood is because, I think, more than any other emotion, it is responsible for most of the interpersonal violence in the world, most of the cases of assault and homicide. If you look at how most homicides work, it typically involves unmarried men getting into a fight over something trivial. For example, there was a case in Scranton, Pennsylvania, where a man shot another because he had shovelled his snow and blocked his driveway. They got into an argument and one shot the other. I think from a societal point of view, that is important to understand.

There are more common cases. Anger can damage relationships. It can help your relationships, too. On the other hand, anger is important because if you have never experienced it, people can take advantage of you. There is a reason anger evolved. So, when you understand the grammar of anger, the variables, and how they work, it can better help you resolve conflicts because you can specify exactly what it is that you are angry about.

What triggers homicides or violence? Is it anger or aggression?

Anger is an emotional programme. It is a part of natural selection that helps us bargain for better treatment. Aggression is defined, usually, as behaviour,

muscle movement, or something you do that imposes a cost on someone else. There are different definitions of aggression. In most cases, aggression, I think, comes from anger. But there are other causes of aggression as well. It can be fear, hatred and jealousy.

Aggression can come from a cost-benefit analysis. Think of a hitman or somebody who uses aggression during a crime not because they want to hurt someone but because they want to get access to money.

The bottom line is that some degree of anger is good. But extreme levels result in some kind of violence. You can find instances of extreme anger where a person ruins their own life. Take the case of the man in Scranton, Pennsylvania, who shot his neighbour over snow shovelling. When he was done with that, he went back to his home and shot himself, presumably because he did not see any point in continuing to live. When people get angry, they do not make the best decisions.

So, there are certainly problems with anger. If you stack them up, anger can be devastating to marriages, relationships and friendships.

Why would anger evolve in humans if it can inflict damage?

We evolved from people who did get angry. They got angrier under some circumstances than others, and for different reasons. When they were angry, they became violent or aggressive in some circumstances, but not in others. So, what you end up with is a very complicated system. This makes sense because if you think about our evolutionary past, the function of anger, I argue, is that it gets people to respect you. It is a way of saying



IT IS COMMON TO BE ANGRY WITH NO HATRED. THE LAST PERSON YOU WERE ANGRY WITH, IS PROBABLY SOMEONE YOU LOVED... IT IS RARELY SOMEONE THAT YOU HATE

that you cannot treat me this way. And then when the person apologises, anger goes away.

Evolutionarily, the amount of respect you were given in the past had a dramatic impact on your probability of surviving and reproducing. We are a social species and the ability to get status and respect was incredibly important. People who did not get that presumably died and they had far fewer children. We are descended from people who managed to get respect and they appear to have gotten it by using anger and by using it in very complex ways.

Just to give an example of the simple kinds of complexity. One way to get others to consider your welfare or care about you when they make decisions is that you threaten to hurt them if they do not. And so

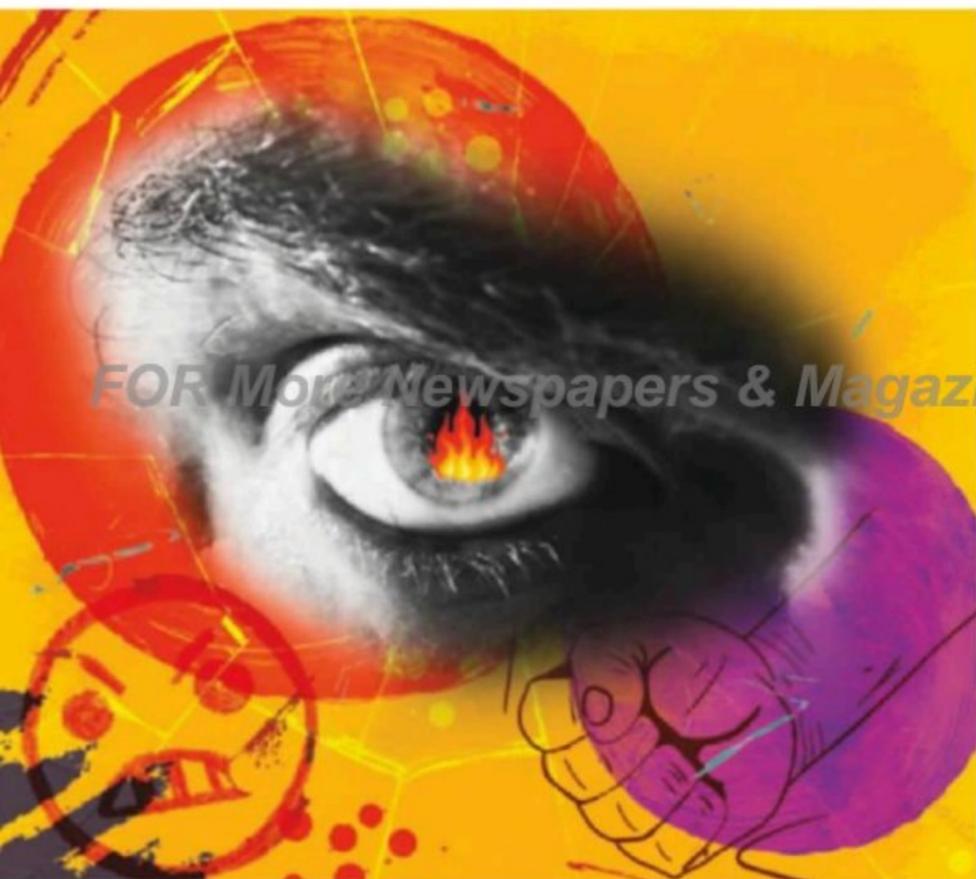
anger can become aggressive. However, aggression does not work as well in other contexts. If you think about a harmonious relationship between spouses in a healthy marriage, you do not threaten violence, typically. Instead, when you get angry, you are likely to start withholding benefits like giving them the silent treatment.

Both cases feel very different. One is inflicting aggression on the body and the other is withholding benefits. But the math is the same, which is: I am going to hurt you if you do not treat me better.

There are times when you get angry over something trivial, and all you want is for them to realise that you are right in this circumstance. For example, you might want the last donut and they want

that as well. You might think they do not realise how hungry you are. So, you are not demanding that they respect you more. You just want that donut and you want them to know how important it is to you.

You see surprisingly similar patterns in other animals, too. When bald eagles, for example, are fighting over food, they lift their neck and extend their gullet to show the weight of their belly. It is a sign that this is how hungry one is. The other eagle will do that as well. Both birds will estimate who needs this more. This is relevant because the hungrier animal fights harder and longer, and therefore, you probably should not pay those costs to fight them.



What drives lynching or any hate crime? Is it usually anger or hate?

I think, most of those cases are driven by hatred. So, I make a distinction here because anger is much more common. The goal of anger, if you look at how it works, is to get someone to recalibrate and to treat you better. This is why, for example, apologies work.

You hate people who do horrible things to you, or those who ruin your life, or [people whom you] envy because it often leads to hatred. You cannot apologise your way out of hatred, typically. When I started thinking, well, what is the difference between anger and hatred? What is hatred trying to do? What

problem is it solving among our ancestors? And then you think what do you do when you hate people? Well, you tell people about it and how terrible they are. You spread bad information about them. And some of that can be lies. You also want bad things to happen to people you hate. I pulled all this information together and saw what hatred is doing: It is trying to neutralise people whose existence is bad for you.

If you think about how our ancestors lived, there would have been certain adversaries whose existence was either good or bad for our ancestors. If they were hurting our ancestors, the ancestors should have been selected to solve that problem. How do you solve that problem? Well, you heap costs on the adversaries as badly as you can, and as efficiently as you can. They then either die or leave because their lives have gotten worse. Or they lose power, like a dictator, for example.

Anger has a face. But hatred does not seem to have one. If you look at really famous actors or actresses who play hateful characters, Cersei Lannister from *Game of Thrones* is a good example. Her face just gets kind of intense when she hates someone. It does not change the eyes, eyebrows, nose, and the like. And the aggression that hatred motivates seems very different, too. It starts with pushing and shoving or name-calling, and then neither side backs down, and neither side apologises. It escalates and violence happens and it may be lethal. It also triggers a different kind of violence, which is: I am going to wait until you are not looking, and then I am going to mess you up. Or I am going to hurt you as badly as I can, and then laugh about it. Hate is designed to remove and neutralise the target. It has this sort of sadistic quality. You will see that in lynchings.

People can relate to hate very easily. Think about any movie with a villain, and in the end, they get what is coming to them. We are happy to watch them suffer.

Hatred is driven by issues of envy, much more than anger. We are designed for small-scale societies. When we look at wealthy and successful people, we think our lives would be better if it were not for them because then we would have all the riches or success. It leads to a kind of envy. Then you start spreading bad rumours about them and hating them, and occasionally they get slaughtered. **DTE**



WRATH

OLGA M KLIMECKI

The primary motive behind anger is to change a situation. People usually feel anger when they encounter something unfair and they feel they can do something about it

How has our understanding of anger evolved over the years?

I study brain regions that are more related to the emotional component of feeling anger.

Understanding what happens in the brain sometimes informs us about the potential biological and psychobiological mechanisms. Sometimes it can inform us more than self-reports, which might be biased due to an individual's social desirability.

Initially, when I started this research, I thought anger was a destructive emotion. However, I was surprised to find that anger is not always related to antisocial behaviour. So, I looked more into the literature on anger. I found anger in conflicts can be constructive or destructive. It depends on how anger is used. While this emotion can motivate destructive and harmful behaviour, it can also motivate behaviour to restore justice.

Anger is associated with this feeling that we are in control and that we can change the situation. So, anger can be very constructive for conflict resolution, depending on how it is used.

A main contribution to the view on anger is research in conflict-related areas. There has been research on different emotions in conflict. We know now, for instance, that hatred is a very bad emotion. In hatred, you assume the other person or group is inherently bad and never going to change. This is different from anger. In anger you assume the other person has done something bad, or the other group has done something bad. So it is more focused on the action. In anger, you still feel in control of the

situation and you have this evaluation of the situation that it can change. So, anger is far less destructive than hatred.

By doing research on emotions and the relation between different emotions and different behavioural outcomes, we can better understand how specific emotions are related to behaviour that promotes the resolution of conflict and reconciliation.

How do scientists induce anger in the laboratory?

A lot of the studies showed pictures of angry faces, and seeing an angry face could, for instance, induce fear. So, the brain activation they might measure might be fear. You might feel anger when you see an angry face, but that is not necessarily true.

Some of the better studies used some kind of behavioural manipulation. Then, some studies are script-based, where participants are asked to remember an event where they felt angry, or they are told to imagine an event where they could feel angry. I think, the problem with imagining events is that some people imagine events very well. Also, the events you might imagine might be very different from those that I might imagine. So, it is hard to standardise the situation and measure a kind of common brain activity.

In my study, I tried to induce relatively real anger without necessarily harming the participants. I constructed an economic interactive paradigm, where participants interacted with two other people—one fair and one unfair person. Anger was induced



WHILE ANGER CAN MOTIVATE DESTRUCTIVE AND HARMFUL BEHAVIOUR, IT CAN ALSO MOTIVATE BEHAVIOUR TO RESTORE JUSTICE

through the unfair behaviour. We measured anger using the functional magnetic resonance imaging (fMRI) scanner, a type of fMRI scan that can show which areas of your brain are most active. But this is difficult to do because we create an artificial environment and it is difficult to induce a real-life anger-provoking situation while a person has to lie still and cannot move more than 3 mm. The experiment lasts usually about half-an-hour, sometimes, up to an hour, for an individual.

You argue that aggression, and not anger, involves causing harm to others. Does anger not do that as well, in certain situations?

Not necessarily. Anger has the primary intention of

changing a situation. People usually feel anger when they encounter something unfair and they feel they can do something about it. Anger comes with the motivation to change things for the better, to restore fairness.

Restoring fairness can be done by causing harm to others, maybe. It is debatable. I do not subscribe to that. But some people do think that causing harm to others can help restore fairness. But this can also be achieved by peaceful negotiations.

Aggression, however, is a destructive behavioural tendency, and, therefore, is different from anger. Sometimes anger and aggression are linked, and at other times, they are not. This, I think, is a key differentiation between anger, which is the emotion, and aggression, which is the behaviour.

Do anger and aggression activate different portions of the brain?

In the scanner, I deliberately provoke anger in participants by exposing them to unfair behaviour. At another time in the scanner, I induce aggression. Then I looked at the brain activations while they were being provoked (associated with anger) and while they were choosing antisocial actions (aggression).

When they were being provoked, we saw activations in a brain region called the amygdala. So, this is a brain region associated with the detection of relevance. So, probably when they were angry, the unfair behaviour of the other seemed more important to them. We also saw stronger activations in parts of the temporal cortex and parts of the fusiform cortex. The temporal cortex indicates what happened in



cognitive terms. The fusiform cortex is in the back of the brain, which processes visual information related to faces. So, probably the stimulus was more relevant to them and they paid more attention to the face.

Then, when they decided to behave, maybe, unfairly, we saw more activation in parts of the posterior cingulate cortex. It is an area often related to self-referential thought, mind-wandering and rumination. So, maybe, they were thinking that this person has been unjust to me in the past.

Do we clearly understand which regions of the brain help control or regulate anger?

On a biological level, we have some insights. But we have not fully understood it. One aspect that emerged from my study is the role of the dorsolateral prefrontal cortex (DLPFC), which is the area of the brain situated behind our temple. It is important to control emotions or thoughts and to also control behaviour.

We see from my experiments that when participants have more activation in DLPFC, the brain area that controls emotions and regulates emotions, they are less aggressive later. So, it seems that controlling your emotions during provocation is associated with less aggression. But we need more studies. We need studies that manipulate DLPFC. My study is the first to show that there is a relationship between anger control and DLPFC, but then we need more studies to establish the causality of these different mechanisms.

Do we understand why activation of DLPFC could lead to a reduction in antisocial behaviour later on?

We do not directly understand it. I think, the new hypothesis we could deduct from this experiment, which has to be tested, is that if people regulate their emotions during provocation, it might impact their behaviour later on. We know from other experiments that emotion regulation can reduce antisocial behaviour and increase pro-social behaviour. But it should be tested to establish the causality of it because this was not a randomised controlled trial.

How can scientists manipulate the dorsolateral prefrontal cortex activity?

In theory, this brain region can be manipulated in different ways. It can be manipulated through feedback, when participants are lying in the scanner, they learn how to control their anger. Or you can do it externally, by applying a current that down-regulates or up-regulates certain brain activities. I do not engage in these experiments personally, but other groups do. To show the causality, it might be interesting to do these kinds of experiments. **DTE**



WRATH

ALESSANDRO GRECUCCI

Extreme anger manifests in the form of hate. Both are connected at the cognitive level, when anger becomes more like a thinking process of hating someone

Do we understand anger?

Anger is highly associated with problematic behaviour and pathological conditions like personality disorders, antisocial personality disorders, borderline personality and narcissistic behaviour. In the near future, maybe, we can use our understanding of which regions of the brain are associated with emotions to build predictive models to understand, diagnose or prevent emotion-related problems. This involves scanning brains and using these predictive models to recognise difficulties, for example, in regulating, expressing and inhibiting emotions.

So, anger is poorly understood, at least at the scientific level. There are so many clinical hypotheses derived from clinical observation. These theories still need to be clarified. For example, there is an interesting hypothesis which says that attachment disruptions caused by excessive anger in primary relationships or with relatives or caregivers, can be the main pathological mechanism behind all psychopathologies. But we do not understand exactly what happens at the brain level. It can be very interesting to study this.

How do these neuro-predictive models work?

We can use neuro-stimulation techniques, which involve placing electrodes in certain regions of the brain. Through this, we can modulate brain activity with a very mild current. It can help increase our abilities to verbalise or control emotions. Many of them are non-invasive and absolutely safe. They do not have side effects.

What does your research find about anger?

Anger is a very complex emotion. When we started studying it, there were very few studies. Most were on seeing how the brain reacted to anger provocation. This involves participants observing angry facial expressions and we recorded their brain activity. In the beginning, we had a very partial view of this emotion. In the last five years, we have tried to break down this emotion into several components.

There are differences in the way we control anger. Some people are very skilled and good at controlling anger, while others have very poor control or lack of complete control of anger expression. In those cases, you can find pathological manifestations like aggression or outbursts of anger. It can be very detrimental at the interpersonal level.

We have also shown differences between the anger we feel within us and the anger we perceive in others. Both are different because when we feel others' anger, we may react with fear or counter with anger. It is completely different compared to when we experience anger. All these aspects were not so clear in the scientific literature earlier.

We have run several studies. For example, we have seen that people who are antisocial and face borderline personality disorders express, inhibit and control anger differently.

Under what conditions does anger lead to mental health or interpersonal problems?



IF ANGER IS WELL EXPRESSED OR EXTERNALISED, IT CAN INCREASE ATTACHMENT. SO, IT CAN BE VERY USEFUL AS AN EMOTION

Externalising or expressing anger is quite good. Anger, although it is considered a negative unpleasant emotion, serves a very good purpose because it can block unfair behaviour from others or establish limits. However, sometimes when we lose control, the externalisation of anger can become pathological because we use not-so-useful and harsh ways to express it like verbal or physical aggression.

Also, internalisation of anger can sometimes be good. But, usually, it is associated with psychopathology, too. This is because we do not express our anger and so we do not regulate other people's behaviour and interpersonal interactions. As a consequence, we internalise anger and start ruminating about events and people. This increases

the arousal of anxiety, rumination and negative thinking inside us. It can be very detrimental.

Unfortunately, when we do not express that anger and suppress our emotions, we tend to experience some physiological signals of stress, like increased blood pressure. This means that by inhibiting or suppressing this emotion, we have a side effect. This can be then related to, or causing, functional disorders like unexplained physical pain or muscle pain because we are redirecting the anger inside us.

What about people who are prone to getting angry?

We call that trait anger. There is some indirect evidence that people who are prone to experiencing

anger very frequently in their daily life, also face medical pathologies like heart attack risk or blood pressure. So, yes, it seems that they are connected.

What about extreme anger? How angry is too extreme?

There is no clear boundary between anger and extreme anger and other manifestations in science. For our understanding, extreme anger can take the form of aggression in physical or verbal form. Extreme anger can be strongly associated with this kind of outburst of anger. For example, antisocial, narcissistic personalities show outbursts of anger when they get frustrated or humiliated.



Extreme anger can also be expressed or it can manifest itself in the form of hate. Hate is usually considered connected with extreme anger, but more at the cognitive level, when anger becomes more like a thinking process of hating someone. So, these are the two destinies that extreme anger can take.

You also talked about anger perception and experience. Why is it important to study these aspects?

We believe it is very important because they refer to different phenomena. When we began studying anger, colleagues pointed out that when you are

processing anger, some regions are activated in the brain. But anger is a very complicated and a very multifaceted emotion. We did a study after reviewing all the neuro-imaging studies on anger. That is when we realised that two separate phenomena were combined in the literature, creating confusion.

One is anger perception. This happens when we perceive someone as looking angry from their facial expression or bodily movement. Second is anger experience, after anger was provoked in participants. We realised that there were two completely different phenomena. So, that is why we kept them as two categories. For example, during anger perception, there was activation in the fusiform face area because it was connected with facial bodily expression and also in the inferior frontal gyrus, the amygdala, and the superior temporal gyrus. It is notable that the amygdala is connected with emotions.

Whereas when we analyse the anger experience, when subjects that were feeling anger and not perceiving anger in others, we saw activations in the insula (which is associated with anger reactions and also with the arousal of anger) and also in the orbital frontal cortex (which is specialised in the anger reaction and in externalising or expressing anger). This was the first proof that anger can be broken down into sub-components. Otherwise, if we put them together, we get a confused picture.

Do we have enough data on whether suppression of anger is associated with guilt, anxiety and depression?

We do not have a lot of data, but we have very good clinical observations and considerations. I am a neuroscientist and also a psychotherapist. In psychotherapy, we know that sometimes at the developmental level, because of societal or family problems, like education, conditioning, excessive punishment or inhibition of our anger expression, you try to inhibit the excessive expression of anger.

There are also some genetic or temperamental differences. For example, people developing personality disorders usually have excessive anger reactions from birth, from the beginning. **DTE**



SLOTH

MICHAEL INZLICHT

As with all personality traits, laziness is a combination of genes and environment

If people choose to exert less effort, would it be right to characterise them as lazy, or is the term being loosely used in society?

“Lazy” is not a scientific term. I suppose you could define laziness as the lack of willingness to exert effort for some reward. But it turns out that all of us are lazy; not just humans, other animals too. All of us would rather exert less effort than more for the exact same reward.

However, some of us have a greater appetite for effort. Some of us are more willing, especially depending on likes and dislikes. Maybe, some people are especially willing to exert mental effort. Some people really like doing crossword puzzles, and there is no real reward for that. You rarely get prizes for doing a crossword puzzle or sudoku. But you do it.

Some people have a greater need to think about problems, to think through things, and then get enjoyment out of it. Some people do it less. So, would you characterise the people who enjoyed an activity less as lazy? Maybe, you could. But it can also be that the reward is less rewarding for that person. So, they do not deem the effort worthwhile. Maybe, they do not get much from completing a crossword; so the reward is not valuable.

So, laziness seems to be a bit more of a judgment call or a moral evaluation that we apply on people. It is not necessarily a scientific term, though.

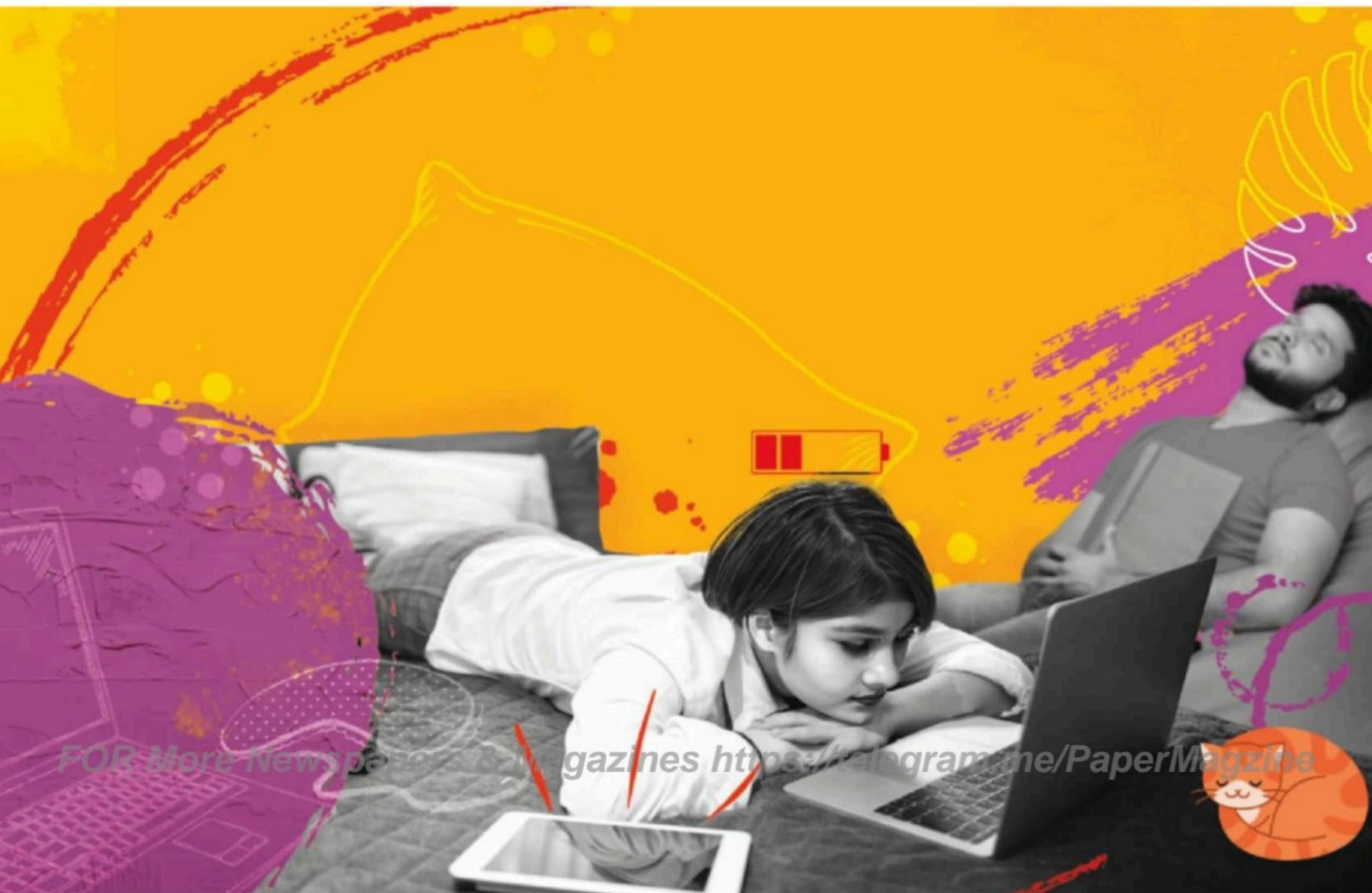
You talked about some people having a greater appetite for effort. Do we understand what drives this?



Personality psychologists, over decades and decades of research, have suggested and there is a lot of evidence to confirm this, that human personality falls under five dimensions, some say, maybe, six dimensions.

One of those personality traits is called conscientiousness. A conscientious person is someone who is orderly, follows norms and rules from authority or society, is thoughtful, plans, and has some virtue. Another characteristic is that they are industrious, they have an appetite for effort, they seem to exert effort, and they seem to derive meaning, or even pleasure, from it.

But the question is, where does this come from? As with all personality traits, it is a combination of genes and environment. We do know that conscientiousness, like all other personality variables,



IF I LIKE MATH, I DERIVE PLEASURE FROM IT. MY SON DOES NOT. DOES THIS MEAN I AM LAZY AND HE IS NOT? NO. FOR HIM, THE EFFORT WOULD NOT BE WORTH IT

are strongly heritable, meaning you get genes from your parents that give you an appetite for effort or not.

But we also learn. We also learn from our cultures. So, some cultures really promote efforts. So, famously, at least in the West, people talk about the Protestant work ethic. This branch of Christianity promotes hard work. The idea is that the more you push yourself, the more goods you gain in this life and the more you have grace in the eyes of god. But it is not just the West. Mahatma Gandhi famously said: “No effort, no glory.”

So, in the real world, animals and humans that benefit the most are the ones who tend to work the hardest. This is not always the case, though. If you are lucky, privileged, and you are born into wealth, you do not have to work that hard and you get benefits.

But think about animals. If you are a squirrel foraging for nuts in a tree, the more willing you are to climb high, the more nuts you will get. The faster or the harder you work, the more you will get and the more you are likely to pass on your genes and have a successful line. So, it could just be an adaptive thing.

Do we understand if humans prefer physical efforts over mental ones or vice versa?

I do not think we have an answer to that. It seems people will have different tastes or effort profiles for physical or mental activities.

Even within physical and mental activities, there are different kinds of tasks. So, running very fast

requires a different kind of effort than lifting weights or endurance running. People who have appetites for any one of these things might not have an appetite for the other. So, it is not clear to me that there is necessarily a connection between effort and willingness in the physical and mental domain. But we do not know. It is possible that there is something that unites both of these things.

One thing that possibly unites both is that effort has a characteristic feeling. If you make a certain face, like furrowing your brow, it does not feel good. People describe the feeling of effort as unpleasant, aversive, irritating and frustrating, as well as something that induces anxiety. That feeling is the same whether you are physically or mentally exerting.

But when you are really trying to run, you are physically exerting and that is painful, but you are also trying to push yourself. Your body is screaming to stop, but your mind is asking you to continue.

The same thing applies to mental effort. Your mind might say that you cannot do this anymore, but you just keep doing it. So, those feelings and, maybe, the verbal statements you tell yourself are similar. So, maybe, there is some language in one's appetite for physical and mental effort. But right now we do not have any empirical evidence.

If people put in effort towards something, does that mean that they are less likely to feel lazy?

Say we give people a list of all the possible things they could do in their daily life, like emailing, commuting, Zoom meetings, doing homework, eating, drinking, sleeping—all the various things that people do—and then ask them to say how effortful or challenging each of these activities are. And then we ask people how much meaning and joy do they derive from doing these tasks. What we find is that the more effort a task requires, the less joy people derive from it. So, doing homework is less pleasurable than watching television. Going to a party is more pleasurable than doing your taxes. But, then, when we ask people how meaningful these tasks are, we find the opposite. We find that the more effort they exert on a task, the more meaning they ascribe to it.

What do we mean by meaning? We mean it is important, it is significant and it structures life. It seems like people derive some meaning. And again, maybe, that just has to do with things like statistical learning or cultural learning.

But we have done some studies where we give people a hard task versus an easy task that is meaningless. And then we ask them how meaningful was that task? The harder they work, the more meaning they say they got from a task. But you can also just think about it a little bit more deeply, like a crossword puzzle, as some people really believe that is meaningful. Why is it meaningful? They are just putting letters in boxes and solving problems that no one cares about. It is not a particularly useful skill.

How much of a role does interest towards a particular activity, regardless of whether it is physical or mental effort, play in this?

Interest matters a great deal. So, as I mentioned with the law of least effort, when the rewards are equal, people prefer to engage in less effort than more effort. But when we include interests, the rewards are not equal anymore.

If I like math and derive pleasure from it, math is more rewarding for me. So, therefore, the effort is more justified. So, we are more willing to exert effort for the things that we like.

We are more willing to exert effort for the people we like. But that is still very consistent with the law of least effort, because now the reward is not only objective, there is a subjective component to reward. So, how much do I like this thing? I am a professor, I like reading and thinking. My son does not. Does this mean I am lazy and he is not? No. For him, the effort would not be worth it. For me, it is. I gain more value.

My son, on the other hand, loves soccer. So, he plays soccer all the time. He exerts a lot of effort towards the sport. I do not. In this case, I might come out lazy because I do not want to play soccer. But the fact is that I do not value soccer to the same extent as my son. **DTE**



SLOTH

NOBUHIRO HAGURA

We are designed to reduce unnecessary effort, whether it is mental or physical. What scientists are working on is to figure out how the brain decides what is necessary and what is not

You say humans are wired to be lazy. Why is that so?

If we are faced with an option that requires more effort, we tend to avoid that. Our brain works in a reward and punishment sort of way. If you really want something and that requires effort, that effort becomes the cost. If your brain overcomes that cost, then you go for it.

But if our brain decides that desire for something is less than the effort cost, then we try to reduce the effort cost as much as possible. Suppose you have an apple in front of you and you want to eat it. There are many ways to reach the fruit. You could just walk straight or jump three times to reach it. But jumping does not make sense. You want to minimise your energy to get to the apple. We try to reduce that physical activity as much as possible. It is a very rational strategy any organism can adapt to.

Are effort costs also applicable for mental activities?

Fundamentally, yes. We are designed to reduce unnecessary effort, regardless of whether it is mental or physical. What scientists are working on is to figure out how the brain decides what is necessary and what is not. So, that is a big question.

Humans care about high order things like decision-making or how we see the world. But our body is the only way we can interact with the environment. I am interested in how we move our bodies, figure out the world and how we interact with the environment.

What do brain scans look like when we exert effort or are being lazy?

If you are asked to learn something, your brain activity will be very high at the learning stage. But once you get used to it, your brain activity will become smaller because it learns how to minimise the unnecessary activity in the brain. So, it is designed to be lazy and there is some evolutionary reason why we reduce unnecessary efforts.

In fact, it is not just human beings, but every organism follows this rule. Unnecessary effort means unnecessary expenditure of energy. You do not want to get tired and fall asleep, lest you will be preyed upon. That is the rule of nature.

The brain is less active in a normal situation, but less active does not mean it has shut down completely. Even if you are not engaged in any specific task, the brain is still working. So, perhaps some people say that it could lead to some kind of creativity or spontaneous thinking.

The second thing is that being too lazy is quite interesting. We know working out or running is good for your body. Yet we try to avoid it. I think, that is not only about the effort cost, but it is more about the balance between your desire and the cost it entails. So, some people are good at valuing the long-term goal. But people, typically, tend to do things for the immediate value, and if the immediate value is too small, then your effort cost wins.

But if someone values the long-term goal more, then the cost would be smaller. So then people can overcome laziness. And how you do that is another



BEING TOO LAZY IS QUITE INTERESTING. WE KNOW WORKING OUT OR RUNNING IS GOOD FOR THE BODY. YET WE TRY TO AVOID IT

question. Maybe, it is how you are educated or perhaps some people's brains are better at estimating the future goal; some people are not.

So, does laziness basically boil down to decision-making?

Yes. During decision-making, you gather all sorts of information, take the balance, and get the best out of it. So, if you make a wrong value of a certain thing or wrong cost of a certain thing, then your decision-making would seem irrational.

Your team at the Center for Information and Neural Networks in Osaka, Japan, is designing an

optimal environment for humans to minimise cognitive and physical effort. Could you elaborate on that?

In Japan, we use trains a lot to commute. The suicide rate of jumping into an oncoming train is quite high. But if you construct a small wall, or a gate, the suicides rates are drastically reduced, even if it is easy to jump the gate. I believe this is because there is a small additional physical cost to jumping or climbing the gate.

Another example would be to design the road or stairs in a way that allows people to move in a very efficient way—more like a human-centred design.

I have heard cases of a country—I think, Switzerland—creating designs for their stairs in a

IF A PERSON DOES NOT DO WORK, HE IS LABELLED LAZY. PERHAPS IT IS NOT HIS LAZINESS. IT COULD BE HIS BRAIN TREATING THE ENVIRONMENT AS NOT EASY TO MOVE. THEREFORE, HE STAYS PUT

way that people would choose the stairs instead of a lift to stay physically active. The stairs were designed to produce a sound if a person jumps on it. They work like a big piano. In this case, a majority are likely to use the stairs. So, that is really amazing because no one is forcing you to use the stairs. We see that people spontaneously choose this option.

Given this understanding, should we change how we view and respond to laziness?

I think, what the current society is labelling as laziness can be avoided by slight changes in design. For example, the design of the desk, table, keyboard, and even the road. Then, perhaps, we can really

understand humans and we could implicitly guide them to do the particular task. If I am able to accomplish this, then the labelling of laziness may change in the future.

If a person does not do work, he is labelled lazy. Perhaps it is not his laziness. It could be his brain treating the environment as not easy to move. Therefore, he stays put.

But with slight changes in design, he might be able to work easily. Then he was not lazy; he looked lazy because of how he treated the environment and that could be different from the other people. So, I think that can be something we can start thinking of. For instance, a particular set of societal infrastructure that should be applicable for every single person. We could think of a

tailor-made structured working environment.

Do you think we should do away with the word “laziness”?

Laziness is really defined by society. I do not know how this change can happen. But if you really understand everyone’s demands and costs, then perhaps the word lazy may go away in the future. **DTE**



So, I thought if we could design how humans perceive their environment, we could design the optimal infrastructure of the city.

Currently, I am not designing this, but that is something, I think, our study may certainly contribute to—ways people can stay physically active. We call this “nudge” in economic terms. So, I was thinking something like that, to nudge people more.



SLOTH

TODD McELROY

As humans became civilised, they had more opportunities to be lazy. It was an opportunity to utilise energy on something more important

Was laziness a part of our evolution?

In my view, laziness is not a bad thing. It is an evolutionary trait. When you look back at our species, you can see that as we evolved, laziness was built into this process. Laziness became especially robust during times of human development. So, the more we developed, the more time we had to be lazy. And by being lazy, we often think of it as just laying around. But in fact, some of the greatest innovations, greatest feats in creativity and the biggest leaps that have ever occurred in terms of human thinking have occurred when people were being lazy.

Some of the world's greatest thinkers—the 16th century French philosopher René Descartes, for example—were notorious for being lazy. They could not get Descartes out of the bed. But look at what he accomplished. His famous phrase, “I think, therefore I am,” was just a minor contribution. Albert Einstein was known for being indolent. He spent a whole lot of time laying around, but he did accomplish things in his life.

So if you look at it from that perspective, as humans became more and more civilised, we had more and more opportunities to be lazy. And when we are lazy, it is an opportunity for us to utilise energy that we normally put into our physical activity into something more important. This is critical because we have a finite amount of energy to spend. So, that energy can be used to do something more creative or innovative.

If we would get away from this negative

connotation of laziness, it can be a positive trait, going forward. I think, a lot of the negative connotation has been built in because work became synonymous with physical labour and that happened, probably, during the Industrial Revolution. The idea was that if you were not out there digging the soil, you were not making anything.

You say that negative connotations associated with laziness emerged in recent centuries. How has science affected the view?

The Protestant puritanical view of things is still the predominant view in most cultures today. In science, laziness does not have a negative connotation. I am a researcher and I think that most people would definitely classify themselves as lazy because they do not engage in this physical labour. Some of the best researchers might seem like they are being lazy, but they are working on stuff. We are applying our energy thinking. And you cannot see that.

But are there exceptions to this where people might not be actually working?

Yeah, absolutely. It is what I refer to as strategic laziness. Strategic laziness can be, in my opinion, one of the most beneficial things that you can add to your life. It is taking away other distractions. It is motivating yourself to focus on specific things. Strategic laziness involves putting other things aside to focus on what is important or paramount.



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SOME OF THE WORLD'S GREATEST THINKERS WERE NOTORIOUS FOR BEING LAZY. ONE COULD NOT GET DESCARTES OUT OF THE BED. EINSTEIN WAS KNOWN FOR BEING INDOLENT. HE SPENT A WHOLE LOT OF TIME LAYING AROUND. BUT LOOK AT WHAT THEY ACCOMPLISHED

Is strategic laziness associated with being physically active?

I am going to go out on a limb and say those who go out there and engage in exercise and good health, also engage in strategic laziness. We have got pretty good evidence to support that. So, this is all about motivation, energy, people who are putting forth their best sense of self, people who are looking for a better sense of self and expanding themselves. They are likely to engage in purposeful exercise because strategic laziness is purposeful. It is about intent, just like exercise is about intent.

Is there enough scientific understanding of how strategic laziness correlates with an individual's economic success?

Many people who are economically successful share traits that are associated with strategic laziness. You would not think of it that way because, again, we have this negative connotation. We think laziness is bad, but it is about how you operationally define laziness.

I use several case studies on very successful people. Elon Musk, for example, is one of the wealthiest men in the world. He admittedly engages in strategic

THE NEGATIVE CONNOTATION ON LAZINESS WAS BUILT PROBABLY DURING THE INDUSTRIAL REVOLUTION, AS WORK BECAME SYNONYMOUS WITH LABOUR. IF YOU WERE NOT DIGGING THE SOIL, YOU WERE NOT MAKING ANYTHING

laziness. He does not call it that; hopefully he will eventually. But just look at the things he talks about in terms of how he says he delegates. He says he will remove other things and focus on particular items at one particular time. That is, essentially, strategic laziness. So, very successful people are big on delegation and getting rid of work. And that is one of the keys to success; it is opening up and freeing this extra time for yourself to be lazy so that you can be creative, so that you can innovate.



There are fears about what increased use of artificial intelligence (AI) could mean for human cognition.

Elon Musk was saying the other day that in 20 months, we would achieve some sort of artificial form of intellectual achievement. This is fascinating, but will that take over our cognition? I do not see that happening anytime soon. No one in my field sees that happening. I mean, AIs and Large Language Models [deep learning algorithms that can generate content using very large datasets] are insanely, incredibly

impressive. But sometimes they cannot even think the most basic thoughts. They cannot do the simplest math. They cannot create, innovate. Will they be there in five years? I do not know.

But to answer your question, I do not think at all that it is a threat right now in terms of our cognition, our creativity, and our innovation. I do not think anyone believes that it is. Is it incredible at pulling out enormous amounts of information and writing code? I cannot even imagine how incredibly powerful it is at that. But can it solve a basic logic problem? No. A seven-year-old might be able to solve a problem like that, but AI cannot do it. Yet.

So human cognition, creativity, and innovation makes us unique. I think, AI will free up a lot of time by taking over mundane tasks. Most of us professionals are going to start having more hours in the day that are free. That is a time that we can engage in strategic laziness. We can focus on our wellbeing, our creativity, and advancing ourselves. I hope that is what people will do. That is my mission in life anyway, because AI is coming. We just have to be ready for it.

What are some of the gaps in the scientific understanding of laziness?

I was a sleep researcher and I accidentally stumbled into the area because I was doing pilot testing. I was using myself as a subject and began to notice the things I was doing. I came out as lazy when I tested myself using laziness metrics. But I knew I was not lazy. I am highly productive and I also exercise. And it created this psychological dissonance in my head.

And from there, I wanted to figure this out. I spent a lot of time thinking about it. I started doing this line of research and no one else has really done it yet. And that is why I had to write a book on it because there is nothing else out there.

To answer your question, other people are not studying it as much. The science behind it is not discrepant because people are not studying it. **DTE**