

NEW

Psychology Now

TAKE CONTROL OF YOUR MIND
FOR A HAPPIER, HEALTHIER LIFE



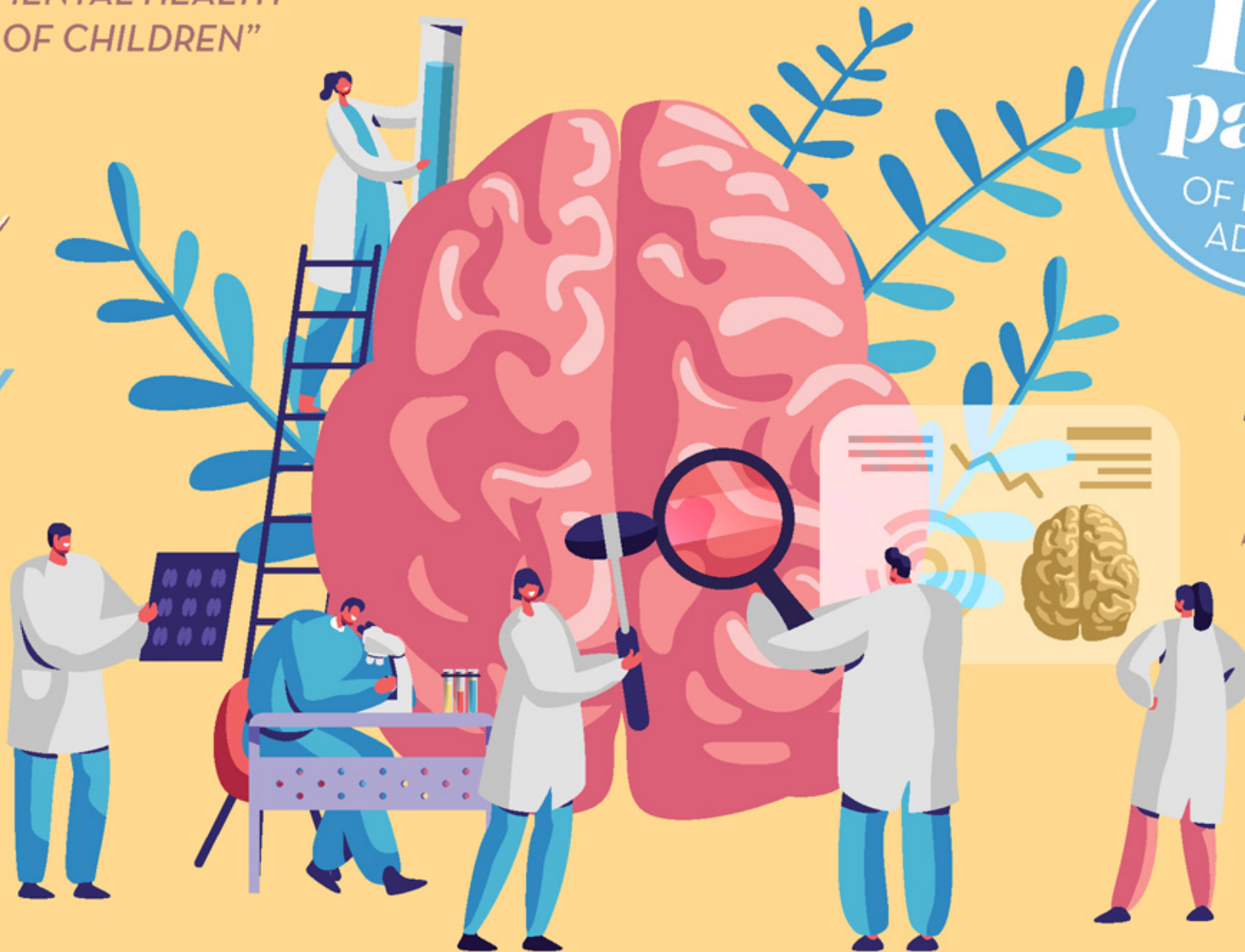
"WE'RE AT CRISIS
POINT WITH THE
MENTAL HEALTH OF
CHILDREN"

Exclusive

**JULIA
BRADBURY**

ON HOW THE
GREAT
OUTDOORS
CAN HELP

132
pages
OF EXPERT
ADVICE



HOW TO STOP
WORRYING
& **START**
SOCIALISING

HEALTHY MIND
Healthy Body

**Digital
Edition**



FIRST
EDITION

+
IMPROVE YOUR SLEEP
LEARN TO MANAGE STRESS
BUILD BETTER RELATIONSHIPS

DEVELOP A
positive
SELF-IMAGE



Welcome to

Psychology Now

TAKE CONTROL OF YOUR MIND
FOR A HAPPIER, HEALTHIER LIFE

Understanding human behaviour and mental processes, whether our own or those belonging to others, is essential if we want to make better decisions and lead happier lives. Why do we feel certain emotions in specific situations? Why do we behave in particular ways? And what can we do to overcome the things that hold us back? Delve into the world of psychology and build a better relationship with your mind. Learn how to be kind to it, unlock its full potential and use it to your advantage.

In the pages that follow, we explore 10 mysteries of the mind, the negative impact of reality TV, how to eat more mindfully, and the complexities of memory. We consider ways to improve our mental health, from learning how to say no, to developing a positive body image, as well as suppressing our inner critic and overcoming social anxiety. We also look at the science behind certain concepts, such as stress, fear, imagination, emotions, body language and much more. Packed full of expert guidance from psychologists, counsellors and other professionals, we also speak exclusively to TV presenter Julia Bradbury about how the great outdoors is a natural therapist, particularly for our children.

The mind is a powerful tool. Learn how to take control of your own mind today for a happier, healthier tomorrow.



Psychology Now

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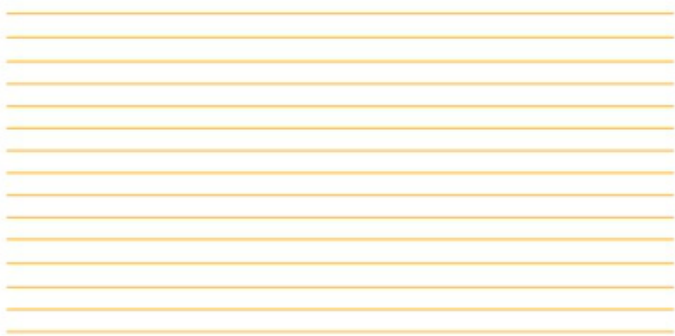
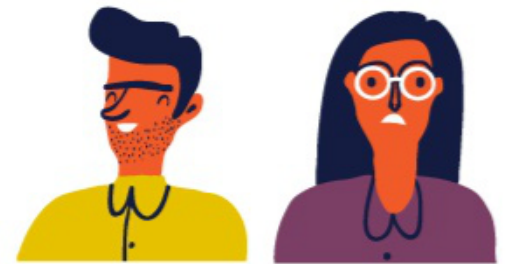
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10



mysteries

OF THE MIND

Much of what we don't understand about being human is simply in our heads. The brain is a befuddling organ, as are the very questions of life and death, consciousness, sleep, and much more

WORDS JEANNA BRYNER

1

CONSCIOUSNESS

When you wake up in the morning, you might perceive that the Sun is just rising, hear a few birds chirping, and maybe even feel a flash of happiness as the fresh morning air hits your face. In other words, you are conscious. This complex topic has plagued the scientific community since antiquity. Only recently have neuroscientists considered consciousness a realistic research topic. The greatest brainteaser in this field has been to explain how processes in the brain give rise to subjective experiences. So far, scientists have managed to develop a great list of questions.



2 DEEP FREEZE

Living forever may not be a reality, but a pioneering field called cryonics could give some people two lives. Cryonics centres like Alcor Life Extension Foundation, in Arizona, USA, store posthumous bodies in vats filled with liquid nitrogen at bone-chilling temperatures of -195°C (-320°F). The idea is that a person who dies from a presently incurable disease could be thawed and revived in the future when a cure has been found. The body of the late baseball legend Ted Williams is stored in one of Alcor's freezers. Like the other human popsicles, Williams is positioned head down. That way, if there were ever a leak in the tank, the brain would stay submerged in the cold liquid. Not one of the cryopreserved bodies has been revived, because that technology doesn't exist. For one, if the body isn't thawed at exactly the right temperature, the person's cells could turn to ice and blast into pieces.



“A PERSON WHO DIES COULD BE THAWED AND REVIVED IN THE FUTURE WHEN A CURE HAS BEEN FOUND”

3 MORTAL MYSTERY

Living forever is just for Hollywood. But why do humans age? You are born with a robust toolbox full of mechanisms to fight disease and injury, which you might think should arm you against stiff joints and other ailments. But as we age, the body's repair mechanisms get out of shape. In effect, your resilience to physical injury and stress declines. Theories for why people age can be divided into two categories: 1) Like other human characteristics, aging could just be a part of human genetics and is somehow beneficial. 2) In the less optimistic view, aging has no purpose and results from cellular damage that occurs over a person's lifetime. A handful of researchers, however, think science will ultimately delay aging at least long enough to double life spans.



4 NATURE VERSUS NURTURE

In the long-running battle of whether our thoughts and personalities are controlled by genes or environment, scientists are building a convincing body of evidence that it could be either or both! The ability to study individual genes points to many human traits that we have little control over, yet in many realms, peer pressure or upbringing has been shown to heavily influence who we are and what we do.



5 PHANTOM FEELINGS

Around 80% of amputees may experience sensations, including warmth, itching, pressure and pain, coming from the missing limb. People who experience this 'phantom limb' phenomenon feel sensations as if the missing limb were still there. One explanation says that the nerves in the area where the limb severed create new connections to the spinal cord and continue to send signals to the brain. Another possibility is that the brain is 'hard-wired' to operate as if the body were fully intact - meaning the brain holds a blueprint of the body with all parts attached.



“THE NERVES WHERE THE LIMB SEVERED CREATE NEW CONNECTIONS”

6 BRAIN TEASER

Laughter is one of the least understood of human behaviours. Scientists have found that during a good laugh, three parts of the brain light up: a thinking part that helps you get the joke, a movement area that tells your muscles to move, and an emotional region that elicits the 'giddy' feeling. But it's not known why one person laughs at your dad's foolish jokes while another chuckles while watching a horror movie. John Morreall, who is a pioneer of humour research at the College of William and Mary, USA, has found that laughter is a playful response to incongruities - stories that disobey conventional expectations. Others in the humour field point to laughter as a way of signalling to another person that this action is meant 'in fun'.

One thing is clear: laughter makes us feel better.

7 MEMORY LANE

Some experiences are difficult to forget, like perhaps your first kiss. But how does a person hold on to these personal movies?

Using brain-imaging techniques, scientists are unravelling the mechanism responsible for creating and storing memories. They are finding that the hippocampus, within the brain's grey matter, could act as a memory box. But this storage area isn't so discriminatory. It turns out that both true and false memories activate similar brain regions. To pull out the real memory, some researchers ask a subject to recall the memory in context, something that's much more difficult when the event didn't actually occur.



8 SLUMBER SLEUTH

Fruit flies do it. Tigers do it. And humans can't seem to get enough of it. No, not that. We're talking about shut-eye, so crucial we spend more than a quarter of our lives at it. Yet the underlying reasons for sleep remain as puzzling as a rambling dream. One thing scientists do know: sleep is crucial for survival in mammals. Extended sleeplessness can lead to mood swings, hallucination, and in extreme cases, death. There are two states of sleep - non-rapid eye movement (NREM), during which the brain exhibits low metabolic activity, and rapid eye movement (REM), during which the brain is very active. Some scientists think NREM sleep gives your body a break, and in turn conserves energy, similar to hibernation. REM sleep could help to organise memories. However, this idea isn't proven, and dreams during REM sleep don't always correlate with memories.

9 MISSION CONTROL

Residing in the hypothalamus of the brain, the suprachiasmatic nucleus, or biological clock, programs the body to follow a 24-hour rhythm. The most evident effect of circadian rhythm is the sleep-wake cycle, but the biological clock also impacts digestion, body temperature, blood pressure and hormone production.

Researchers have found that light intensity can adjust the clock forward or backward by regulating the hormone melatonin. The latest debate is whether or not melatonin supplements could help prevent jet lag - the drowsy, achy feeling you get when 'jetting' across time zones.

“EXTENDED SLEEPLESSNESS CAN LEAD TO HALLUCINATION AND DEATH”



10 SWEET DREAMS

If you were to ask ten people what dreams are made of, you'd probably get ten different answers. That's because scientists are still unravelling this mystery. One possibility is that dreaming exercises the brain by stimulating the trafficking of synapses between brain cells. Another theory is that people dream about tasks and emotions that they didn't take care of during the day, and that the process can help solidify thoughts and memories. In general, scientists agree that dreaming happens during your deepest sleep, that is rapid eye movement.





WHY THE *GREAT* *outdoors* IS GREAT FOR KIDS

The psychological benefits of spending time outside have never been more apparent, especially when it comes to the mental wellbeing of our children

WORDS SARAH BANKES

As a nation, we're spending far less time outdoors than we used to, and this is having a devastating impact on both our physical and mental health. What's particularly concerning is the effect it's having on our children's mental wellbeing. According to the Monitor of Engagement with the Natural Environment (MENE) pilot study, visits to the natural environment by children in 2016 found more than one in nine children in England had not set foot in a park, forest, beach or any other

natural environment for at least 12 months, shown in a two-year study that was funded by the government.

Aside from being shocking, these statistics lead to an array of questions: why are children not enjoying outdoor activities as much as they once were and what are they doing instead? Are there barriers that we're simply unaware of or choosing to ignore? And perhaps the most important questions of all: what are the benefits to spending time outside and what are the consequences of such a lack of exposure?

The MENE report issued in March 2019 found that 70% of all children in England under the age of 16 are said to be spending time outside at least once a week, but there are still clear inequalities, with children living in lower-income areas being less likely to visit the natural environment compared with those living in areas of higher income. Finances are therefore clearly a barrier when it comes to getting children outside. To those living in rural areas, this might seem strange - nature is everywhere; you don't need money to explore the great outdoors! »





But if you live in a low-income urban area, accessibility is an issue. A study from the Wildfowl & Wetlands Trust (WWT), published in March 2019, found that children from poorer backgrounds were less interested in being outdoors in nature than better-off children. But WWT found this difference was overcome after just one day spent learning outside.

Added to financial difficulties is the fact that we lead incredibly busy lives, juggling work with childcare and other responsibilities – taking our children to the park or making

sure they're spending time outside just isn't as big a priority as it once was. It's much easier to put our children in front of a screen while we catch up on housework and other chores.

Nicola Butler, Chair of Trustees at Play England states that “every child should have the freedom to regularly play out actively and independently close to where they live. However there are many barriers to children's play, particularly traffic danger, as well as the closure or neglect of playgrounds and public spaces due to funding cuts. This is a really serious problem and is affecting the health and wellbeing of our children.”

After carrying out research, Play England found that while 71% of adults played in the street or area near their home every day when they were a child, only 21% of children do so today. With many of us living in urban areas and more cars on the roads today, traffic is a real concern, as is ‘stranger danger’ – seemingly made worse by the media, since crime figures relating to this have in fact remained pretty steady over the decades. These worries are echoed in the 2019 MENE report, which shows that children's time outside without adults has decreased over time, from 45% of children aged 10-15 spending time outside independently in 2013/14 to 39% in 2017/18.

However, technology also plays a significant role in keeping both adults and children indoors, as other studies show an increase in time spent undertaking indoor leisure activities. Psychotherapist and author of *Walk With Your Wolf* Jonathan Hoban believes that walking therapy is essential for shaking off the stresses of modern life, and even suggests people leave their mobile phones at home when going out for a walk. “Going for walks, getting out, connecting with family – when people do that, it allows them to process what's happening in their day,” he told a national newspaper in 2016.

So if we are no longer doing these things, what are the immediate effects on our children, and what are the long-term repercussions on the next generation of adults?

Improved mental wellbeing

In 2005, American writer Richard Louv published a book called *Last Child in the Woods: Saving Our Children From Nature-Deficit Disorder*. Coining the term to describe the negative effects a lack of being outdoors in nature was having on children, Louv discussed the consequences, from obesity and attention disorders to less visible conditions such as depression.



Since then, more research has been carried out, and the link between spending time outdoors and our mental health is clear.

In 2018, a major study at the University of East Anglia (UEA) explored the health benefits of spending time outdoors. The researchers studied data from 20 countries, gathering evidence from more than 140 studies involving more than 290 million people. Analysing how the health of people with little access to green spaces compared to that of people with the highest amounts of exposure, Norwich Medical School's Caoimhe Twohig-Bennett said: "People living closer to nature had reduced diastolic blood pressure, heart rate and stress. In fact, one of the really interesting things we found is that exposure to greenspace significantly reduces people's levels of salivary cortisol – a physiological marker of stress." UEA's Professor Andy Jones explains: "We often reach for medication when we're unwell but exposure to health-promoting environments is increasingly recognised as both preventing and helping treat disease. Our study shows that the size of these benefits can be enough to have a meaningful clinical impact."

In 2018, charity Mind found that spending time in green space or bringing nature into your everyday life can benefit your mental wellbeing as well as physical health. For example, growing food or flowers, exercising outdoors or being around animals can have lots of positive effects, such as improving your mood, reducing feelings of anger and stress, helping you feel more relaxed, and improving confidence and self-esteem.

“ THE LINK BETWEEN BEING OUTDOORS AND MENTAL HEALTH IS CLEAR ”

Isolation is also a big problem with young people today, and the outdoors enables them to work together, develop emotionally, increase social interaction and empathy, and enhance personal skills and cooperation.

Taking it a step further, studies have shown that outdoor learning sees a range of positive outcomes, such as better concentration and engagement in learning and academic achievement; better hand-eye coordination and fine motor skills; improved mental health and wellbeing; improved behaviour and attendance rates; self-awareness; improved

sleep; and a feeling of belonging and involvement in the community.

Natural Connections was a four-year project from 2012 to 2016, funded by Defra, Natural England and Historic England, and delivered by Plymouth University. It aimed to transform outdoor learning in schools and concluded: "evidence shows that giving children the opportunity to discover, learn about and experience the natural world is hugely important – it can help create a sense of belonging rooted in their local environment, enhancing their health, wellbeing and educational outcomes. For example, greater amounts of natural space in or around living or learning environments is associated with higher levels of physical activity, better emotional, behavioural and

cognitive outcomes and with children developing a greater sense of connectedness to nature." One teacher involved in the project said: "I am seeing better engagement, and better engagement means they are doing more, so there is going to be better progress." 95% of young people surveyed by Plymouth University said outdoor learning makes lessons more fun.

We all have a responsibility for the future of our planet and its people, which is why this topic must be taken seriously. Our priority to get children outside should be up there with tackling climate change and reducing obesity. Today's children are the future of our planet, and we shouldn't underestimate the restorative power of nature when it comes to their wellbeing. »



Exclusive

INTERVIEW

Julia Bradbury

Walking enthusiast and presenter Julia Bradbury talks to Sarah Bankes about the importance of getting children outside

How does it make you feel when you hear children simply aren't being exposed to outdoor activities as much as they were even ten years ago?

What's happened over the years is we've become a more urbanised world. Many of us now live in cities as opposed to rural areas, so that's had an impact on all of our behaviours. We've also seen cutbacks and austerity, school fields being taken away and sold off, and a general demise in our parks all across the country, and that has serious implications for all of our mental health, because for a lot of people, those spaces are our primary access to the outdoors and to the green space. It's the same with wildlife - the concrete jungles are taking over, and obviously that's had an impact, and I think the scary thing is that when it comes to children, so many are not getting any access to the outdoors these days. They're not playing outside at all, which is really shocking. We've got such high numbers of kids who just aren't enjoying that kind of play, which we know is essential to their development, to independence, to lots of other life skills. There really are some very worrying statistics, and as a mother to three young children, this is obviously something that I care about passionately.

In what way is the great outdoors essential to children's development?

There are things kids do in outdoor spaces that they wouldn't usually do, certainly when you watch them play together outside - they'll make friends with other kids they



“ THERE ARE VERY WORRYING STATISTICS, AND AS A MOTHER TO THREE YOUNG CHILDREN, THIS IS SOMETHING THAT I CARE ABOUT PASSIONATELY ”

don't know, whereas if you take them to a party, even with a group of their own friends, they'll sometimes cling on to your leg and not leave you! It's fascinating, but there's just something about that outdoor space that makes them feel a bit more free, and maybe there's less risk of rejection because they can walk away easily.

I'll give you a great example. In my role as president of the Camping and Caravanning Club, we instil the virtues of camping because it's a really good way for your children to gain their first bit of independence. Unlike a traditional holiday where you stay in a hotel, when you're camping with your kids and they're in their own tent next to you, it's their first taste of independence. They don't think you can hear them or that you know they're staying up 'til 10 o'clock at night with their torches on, eating marshmallows. So it's a great way of introducing them to being responsible and setting them boundaries, and seeing how they react to that in a relatively safe, controlled environment. You can also make them part of what you're doing when you're camping, and give them a role. When you give them a role and responsibilities, it's their first feeling of being grown up.

The nation has associated you with walking and the great outdoors for more than a decade now, but what was your childhood like? Did the outdoors play a big role for you as a young person?

I'm one of those lucky children whose mum and dad were outdoorsy people, but in »

GETTING INVOLVED

Proactive in encouraging children to get outdoors, Julia tells us about some current projects she's involved in, as well as groups and resources we can benefit from

Julia is the first female president of the Camping and Caravanning Club



GROUNDWORK

"I'm patron of a charity called Groundwork, which promotes gardens in urban areas for communities to get involved in. These little green spaces give members of the community somewhere to visit where they can plant and grow things, and learn about the plants themselves. These kinds of initiatives are really important for bringing communities together, but also in relation to the mental health aspect." Visit www.groundwork.org.uk to see what's in your local area.

THE OUTDOOR GUIDE

"We have a lot of partners and friends of The Outdoor Guide (TOG) who work with us to help get people outside and doing all sorts of things like planting trees, going on community walks and so on." Visit www.theoutdoorguide.co.uk for an abundance of walking resources, events and more.

KEEP BRITAIN TIDY

"I'm ambassador for Keep Britain Tidy, and TOG is part of the Great British Spring Clean, the big campaign that Keep Britain Tidy does. Half a million people got outside for the 2019 event, picking up litter in cities and in the countryside. At TOG, we're continuing to promote the campaign with our own partners. People can get a free bag from us via the website and then go litter picking. It's about three things: the community aspect; picking up the litter and keeping the outdoors clean and healthy; and access to the outdoors and exercise." Visit www.KeepBritainTidy.org to see how you can get involved.

CAMPING & CARAVANNING CLUB

"I'm president of the Camping and Caravanning Club, which has more than 700,000 members. The reason I'm involved with them is to help get families camping and outdoors. They have some great family-friendly sites." Visit www.campingandcaravanningclub.co.uk and see for yourself.



The Great British Spring Clean is a great way to get kids involved

THE OUTDOOR GUIDE

Julia set up The Outdoor Guide with her sister, Gina, four years ago, to bring together information for walks all around the UK. Inspired by Julia's love of walking, the idea actually came about ten years ago following the success and sheer volume of questions she received after the first series of *Wainwright Walks* aired on the BBC, a series that is repeated today on channels all around the



world. "They had such an impact on people and became immensely popular, which was quite unexpected at the time," Julia tells us. "I was presenting *Watchdog*, and I'd done *Top Gear* and the *National Lottery* - so some pretty big shows - but I did this little show on BBC4 because it was a passion project for me. The correspondence that followed was phenomenal. So because of that and because the programmes are still there as a staple of TV, which I'm really proud of, The Outdoor Guide was set up to answer the wide range of questions I was being asked, from what's your favourite walk to what boots do you wear to what are the best family walks. But now it's become a bit of a movement for promoting the outdoors generally." Visit www.theoutdoorguide.co.uk and explore hundreds of walking routes for free, from sensory walks to buggy-friendly routes and everything in between. There are also gear reviews, accommodation recommendations, blogs and much more.

different ways. My mum is absolutely not a camper, she's not a walker, but I remember growing up in our little village in Rutland, where I would spend hours in the garden with her, just pottering, lifting up little logs with her. She'd be planting things, and I'd help her - I had no idea what I was doing, but I distinctly remember those times with her. And then I had a dad who - lucky me - was this great walker. He was born in Derbyshire, and he would take me walking from the age of six or seven. That's what we did together. That's how he and I spent our time together. He made it interesting for me, he told me stories - he's got a great imagination. If we came across bones of an old sheep in a field, he'd make up some story about pirates. He'd set me challenges, like who can get to the top of the heatherbank first. And that's what the development of children is all about; it's about their imagination, it's about boundaries, it's about expanding those boundaries for them, and really making things possible.

It goes beyond simply 'having fun' outside though, doesn't it? There's a deeper concern about the consequences a lack of exposure to the outdoors is having on our children, isn't there?

Absolutely. The country is in a mental health crisis. One in four of us is going to suffer from some form of mental health issue in our lives and, having spoken to child psychologists, I know that we're at crisis point with the mental health of children too, and that's not exaggerating. The awareness is better, as more of us are talking about mental health, but when you dig a bit deeper and talk to

Tree planting with Premier Paper Group and the Woodland Trust





Pictured here with her father, mother and sister, Julia's parents certainly influenced her love of the great outdoors



Julia supports various environmental causes

health professionals, the help is not available because the finances aren't there. So even if you pluck up the courage to identify an issue with your children and realise they need help, or your children pluck up the courage to say to you they need help, or it's something that's noticed, there are very few outlets to help you unless you have finances.

How have you found the outdoors to help with mental wellbeing?

Research has proven that, for all of us, time spent outdoors in green spaces with nature, in parks, appreciating even just trees and leaves helps us recalibrate. It's time for us to breathe in physically and mentally, take in our surroundings and take stock. It is simply just good for you. I'm certainly not saying the great outdoors is the answer to everything, but it is a really important part of the puzzle. When you hear that children are spending less time outdoors than prison inmates are, that brings it home. I would urge people to

“CHILDREN ARE SPENDING LESS TIME OUTDOORS THAN PRISON INMATES ARE”

look at the research and do what you can to make an effort to make this a part of you and your children's lives.

Even just planting things and getting your hands a little bit dirty in the soil is something; learning how things grow is an important life lesson, because it's all about appreciating things and caring for things and growing things, which is what we do with our friendships and relationships. It's about getting the balance of those things right. It sounds incredibly simplistic, and I'm not a doctor, but I've spent a lot of time with psychologists and experts in their fields, learning more about this, and there isn't a single person out there who's told me that spending time outdoors is bad for you or that it's going to do you harm, so there's nothing controversial about it - there isn't really a downside to it.

Another important part for kids is that when they're outside among nature, there are all these microbes floating around in the atmosphere that we inhale, and those are good for building the immune system of younger people, which is part of growing up to be healthy.

Research has shown that people in lower-income areas are less likely to visit natural environments than those living in areas of higher income. How can we remove this barrier?

People have often said to me that they don't have access to the countryside, but there are

canals, there are little sanctuaries... You have to seek places out, but they do exist. I live in central London, and we're lucky that there are loads of parks, but I've found lots of little community gardens there too, so check out your local notices and do a bit of exploring. Go for a short urban walk, and you'll be surprised at what little spaces you'll find, and that's something you can do with your kids. If you do a bit of research beforehand, you can make it fun for your kids by giving them clues and turning it into a treasure hunt; or telling them that you're going to try to find somewhere new together - 'let's see what we can find within two miles of where we live', for example. Do it together.

Can you tell us a bit more about the Eco-Schools programme?

My involvement with the Eco-Schools programme (www.eco-schools.org.uk) came about independently but through my connections to other things, such as Keep Britain Tidy and the Camping and Caravanning Club. There are around 19,000 accredited Eco-Schools in the UK. What we're now doing is providing them with an affordable, discounted branded outdoor kit so those schools can buy them and try to break down those barriers that stop children getting outdoors because they can't afford the right kit.

We recently had a glorious heatwave in the UK, followed by torrential rain. It was absolutely bucketing down with rain and »

ECO-SCHOOLS

The Eco-Schools programme has been running for 25 years, and is the biggest educational programme in the world, with 52,000 Eco-Schools across almost 70 countries. The programme in England is run by Keep Britain Tidy, and it “empowers pupils, raises environmental awareness, improves the school environment and also creates financial savings for schools.”

With more than 19,000 registered Eco-Schools in England, the programme encourages schools to actively promote environmental issues by working towards the international Eco-Schools Green Flag award. It puts young people in charge of raising environmental awareness by planning and implementing environmental actions that get their whole school and its community involved. Not only is it a fantastic way to encourage children to work together and become more environmentally aware, but independent research into the initiative found evidence of the positive impact getting outside had on the pupils, for example “increased confidence, development of leaderships skills, improved pupil well-being and behaviour and greater motivation at school.”

Find out more about how to get involved and put a school forward to be registered to the programme at www.eco-schools.org.uk.

I said to my kids ‘Okay, who wants to go outside? We’re going to get all our waterproof kit on and go rolling down the hill and get covered in leaves’. And they went ‘Yeahhh!’. And we did it! We put the waterproofs on, they were completely covered head to toe, and we spent two hours looking for slugs, rolling down the hill, having a leaf fight. We were absolutely soaked. Obviously we’d like it to be nice all the time, and it can be a pain, but some of my favourite moments are when I turn those really soggy days into something special for them. My kids absolutely love it. For them, it’s a real highlight. We always have little chats like what’s been your favourite day of the year, and it definitely makes the top three, which is good!

It’s clear that you have a genuine passion to help get children outdoors. Is that because you’re now a mother and you can see the benefits it has on your own children?

It was important to me before I had children because it was something I’d experienced with my own family, especially my dad. That



Childhood memories of being outdoors last a lifetime



Now a mother of three, Julia enjoys adventures outside with her own children

“THAT TIME SPENT WITH MY MUM AND MY DAD BECAME PSYCHOLOGICALLY SO IMPORTANT TO ME”

Julia has been involved with the Great British Spring Clean since its launch



time spent with both my mum and my dad became psychologically so important to me as I got older. As you become older and wiser, you tend to find that the stuff that was important in your childhood becomes more apparent and obvious.

The outdoors, for me, has at times been my therapist. I've used it when I've been going through tough times. We all have our struggles - there are good and bad bits to life that we all experience (and it's important that we all talk about that too).

We see all these images of people and think they have perfect lives. Mental health has no barriers - it doesn't care who you are, what you do, what you earn, or where you live - so it's important to make sure you have an outlet. And I have definitely used the outdoors for my personal development



and also as a therapist to help me through the tough times.

What benefits have you noticed being outside has on your children?

My kids are outdoor kids and they definitely sleep better when they've had outdoor exposure. My little boy is not particularly sporty. We had sports day recently and, bless him, he didn't win a single race; he didn't even come in the top three of any race, but what he did get was a prize for being positive and for being sportsman-like because he was cheering on his friends. He was supporting them and helping them out. He has different skills. He loves nothing more than running around in the garden, and that's how he gets his exercise. He's not a big footballer. He does play it once a week after school, but it's just not a natural thing for him that he loves. So, as a parent, I've got to find other ways to get him to exercise, and other things that he's going to enjoy, and the outdoors is the way to do it. He loves running around with big sticks, playing tag in the garden; he wants me to chase him around in the bushes as a monster. If that's what it is, if that's what he needs, if that's his physical outlet, and that's the way we're going to get him to build up his strength and resilience and give him a bit of independence, then that's what we do. Kids need to exercise, so you have to find a way to make it enjoyable and find what it is they do love. ■

MAKING A DIFFERENCE

Inspired by the Eco-Schools programme, Julia and The Outdoor Guide have created a bespoke package of outdoor gear to enable all pupils to go outside in all weather conditions. "As Alfred Wainwright said, 'There's no such thing as bad weather, only unsuitable clothing', and I am thrilled to be supporting Eco-Schools to encourage more children to get outside whatever our weather brings! We know it is fundamental for their health, learning development and wellbeing, which are all an important part of Ofsted directives," Julia says.

Included in each pack are a pair of Wellington boots, a pair of socks, a hooded waterproof jacket and trousers, and a rucksack. A branded package is already available for schools accredited as eco-friendly under the Eco-Schools initiative. For schools not yet or in the process of becoming eco-accredited, there is a non-branded version for any primary school to purchase. "These backpacks and waterproofs have been sourced as the basic gear that will allow children to have wonderful outdoor experiences, whatever the weather," Julia explains.

Eco-Schools manager for England Lee Wray-Davies, adds: "It is vital that young children learn to appreciate the benefits of being out in the open air. But it's necessary for them to have the right clothing to make sure they can all make the most of the opportunity and this inexpensive kit means we are now able to ensure no one misses out."

Available this autumn school term, the recommended retail price for each pack is £60 (excluding postage and packaging). The Outdoor Guide is supplying them to Eco-Schools for an exclusive price of £39.50 (with a minimum order of eight packs per school), which includes postage, packaging and a £2.50 donation to Eco-Schools.

It's a fantastic initiative, and *Psychology Now* is thrilled to donate £500 towards supporting the cause.



DEVELOP A *positive* *BODY IMAGE*

*How do you feel about your body?
Transformational coach Alison Morgan uncovers the
power of gaining a fresh perspective of yourself*

WORDS ALISON MORGAN

Our bodies are truly amazing. Carrying us, keeping us alive, creating new life, healing wounds... the list goes on. But these are all things we tend to take for granted and, as amazing as we are, we often struggle to see ourselves in a positive light.

In a social-media-frenzied world, often showing the 'perfect' life or body, having a positive image about our own bodies seems to be increasingly challenging. In one click, it's easy to be thrown into a scenario of comparing ourselves with others and wishing we had the perfect legs, bum or lips (take your pick!), and if we're not careful, it can lead to a downward spiral of self-loathing, low confidence and a negative body image, which can impact all areas of our lives.

As much as we know it's healthy and important for us to have a positive view of our own body, many of us struggle with this daily act of self-acceptance and compassion. So how would life be different if we liked or even loved our bodies a little bit more, and how can we achieve this?

What does a 'positive body image' really mean?

We all see things in different ways, and the concept of a 'positive body image' is no different. It's about how you perceive yourself. Think of it as:

How you see your body

How you feel about your body

The thoughts you have about your body

The things you do that result from this self-perception

Think about how you perceive yourself on a scale of 0-10, rather than simply seeing yourself either positively or negatively. This will probably change on a weekly, daily and even hourly basis due to things happening around you, but the more you start to become aware of how you're feeling about yourself, the better placed you are to take action to move the scale towards confidence, more of the time. Think baby steps more frequently, rather than giant leaps less often.

This isn't about seeing yourself as perfect - perfect doesn't exist. It's also not a destination that you get to and stay at. It's an ongoing work in progress, much like physical fitness; it's something that needs regular attention to make lasting differences and for you to feel more comfortable in your own skin.

To love or to loathe?

We only get one body to carry us through our lives. It's the only thing that you will spend your whole life with, and you have a choice: look after it, nourish it and learn to love it, or waste precious time and energy loathing it, beating yourself up and comparing yourself to others. You wouldn't say negative things to your friends, so why say them to yourself?

True, long-lasting, deep confidence and a healthy perception of your body comes from within. It comes from you accepting yourself, treating yourself kindly, working on being a healthier you, and having positive opinions and beliefs about yourself. It's always lovely to receive compliments from people, but you can't live off these forever. They should be nice to have, not necessary to have.

Living with a negative body image can drain us, control us, and steal our happiness and enthusiasm for living life.

Improving your attitude towards yourself may just turn up your happiness dial. It might not be an easy journey, but wonderful things will happen if you give it a go! What have you got to lose?

A more positive mindset

Being more positive about ourselves more of the time sounds simple, but in reality it can

“MANY OF US STRUGGLE WITH THIS DAILY ACT OF SELF-ACCEPTANCE”

take some work and commitment. Here are some simple areas to start thinking about:

Develop a healthy attitude towards yourself

Developing a healthy, positive attitude towards yourself as a whole, complete human being may mean a shift in mindset, but it is achievable. Nothing positive comes from a negative mindset, and the sooner you start practising this through making small shifts, the sooner you will feel the benefits. Everything is in your power to change; you simply need to believe in yourself.

Explore your thoughts and feelings about your body

Learning to shake off negative beliefs and opinions about yourself may help you move »



WRITE DOWN ALL THE THINGS YOU LOVE ABOUT YOUR BODY

Handwriting practice lines for writing down thoughts.



towards a place of acceptance and respect for your body. Learning to tune in to the thoughts that chatter away in our heads, and learning to have the courage to face the negative ones rather than avoid them, is an important stage in the healing process.

Take action that works for you

On your journey to becoming more positive about your body image, you'll find the things that work best for you. Face the challenge with a learning mindset and be comfortable with taking action and trying new things. Stick with them and build up your toolkit, so when you feel your confidence slipping, you know what tool to pull out!

Put it into action

How often have you thought: 'When I lose this weight, I'll be more confident and happy'? Yes, you might be, but often the effect is short-lived. You're then looking for the next thing and the next. The trick is to start working on your body confidence now, and that starts with your mindset and becoming healthier and stronger physically and mentally at the same time.

Ready to get started? Begin with these simple actions...

Develop a healthy attitude towards yourself:

Accept yourself as the unique individual you are today. Don't let your mind wander back to the past or dream about the future. Practising mindfulness will help train your brain to be more focused on the present and reduce this time travel of your mind.

Focus on your own journey, rather than wasting time comparing yourself to others. You will never be them.

“IT MAY REQUIRE A BIT OF TIME, TRIAL AND ERROR TO FIND WHAT WORKS FOR YOU, BUT IT'S WORTH IT”

Don't be mean, critical or judgemental to anyone - including yourself! Be kind, supportive and show compassion.

Work to improve yourself, but don't strive for perfection. Enjoy the journey you're on, learning what works for you, and be proud of every small achievement you make towards a healthier, stronger, more positive version of you.

Respect yourself and all that your body has taken you through so far in life. Write down three things you're grateful to your body for each day.

Put yourself first - develop a great relationship with yourself. If you don't, it's harder to have effective relationships with others.

Be so proud of yourself; you don't need compliments to make yourself feel better.

Explore your thoughts and feelings about your body:

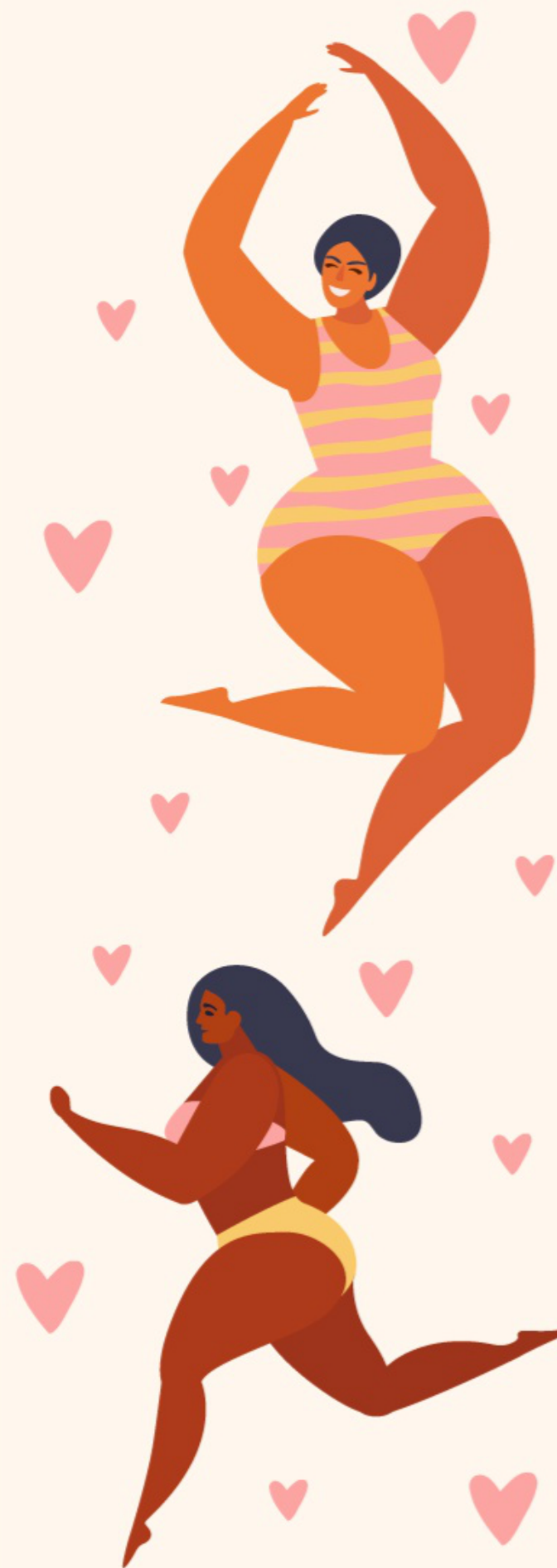
Be curious about how you honestly feel about yourself, and try to go beyond 'I don't like my body'. Try closing your eyes and slowly focusing on each part of your body and see what thoughts, feelings and emotions arise.

Dig deep and try to understand why you feel that way. Can you link it back to something that happened in your past?

Develop the ability to tune in to the thoughts that regularly chatter away in your mind. Try keeping a journal to capture how you feel about your body daily. Notice any themes and things that trigger you to feel worse or better.

Notice when your mind wanders through the day to thoughts about your body. When you notice this has happened, try to focus back on the present moment, whatever you are doing, or your breathing.

We often avoid thoughts that are uncomfortable or painful. Instead, learn to observe them and how they make you feel. This isn't about solving them, but exploring them might bring new insight and reduce their power.



Take action that works for you:

It may require a bit of time, trial and error to find what works for you, but it's worth it. Building a personal toolkit of exercises to use when your thoughts are slipping to the negative will keep you on track to having a positive body image.

The long-term change will come from the internal work you do, but there's also fun stuff, like wearing great clothes that flatter you, treating yourself to a facial, or just spending time with loved ones. Have fun with it all and remember that true beauty is much more than skin deep. ■

THE SCIENCE OF FEAR

Explained: The biology of being afraid & why this primal emotion is key to your survival

WORDS JACKIE SNOWDEN

Home alone at night, you hear a loud crash. In an instant your heart starts racing, your muscles tense and your breath quickens. You are immediately alert, primed to fight or flee the source of the sound, which turns out to be a pile of books falling off that shelf you've been meaning to fix. But in that moment, your brain and body reacted as if you were in mortal danger.

Fear is one of our strongest and most primal emotions. It's a big bad world out there, and being afraid of certain things protects us from potential danger to make sure we survive. Some evolutionary fears are hard-wired into our brains, but we can also develop new fears throughout our lives. As children we pick up on what makes our parents anxious, and we may also learn to fear certain things after negative experiences. Despite this, most of us are able to ignore



our fears when it's clear we aren't in any immediate danger. We can enjoy the view from the top of a skyscraper rather than worry about falling, or turn out the lights safe in the knowledge that a predator won't devour us in the night.

However, people with phobias have an excessive fear response that causes both physical and psychological distress. These extreme fears are divided into three different groups: agoraphobia, social phobia and specific phobias. Agoraphobia is generally referred to as the fear of open spaces, but it applies to the dread of any situation that is difficult to escape from, or where help would not be available if something went wrong. Social phobia is the intense fear of interacting with people or performing, while specific phobias are the fear of a particular situation, activity or thing.

These irrational fears can cause major disruptions to everyday life; somebody with acrophobia – an extreme fear of heights – may experience a panic attack simply trying to walk across a bridge. Depending on the trigger of their phobia, sufferers often go to great lengths to avoid situations that could affect them.

The cause of phobias is not always clear, but many cases are linked to experiencing or

witnessing a traumatic event. For example, somebody may develop cynophobia – the fear of dogs – after being bitten. But whether the trigger is rational or irrational, as soon as the brain registers a scary stimulus, it activates the fight-or-flight response, thus preparing the body for action.



“EVEN TODAY, THE MAJORITY OF AFRICAN LION ATTACKS ON HUMANS OCCUR AFTER DARK”

NATURAL FEARS

Some of our fears have developed as an evolutionary response to danger

DARKNESS

Sight is arguably our most important sense. When we are faced with pitch-darkness we are left vulnerable, unaware of what is around us. At night, our early ancestors were at risk of being attacked by nocturnal predators. A study from 2011 found that even today, the majority of African lion attacks on humans occur after dark, and are more likely when the Moon is below the horizon. Although being hunted while we sleep isn't a risk for most of us, we are instinctively more anxious when unable to see.

HEIGHTS

A fear of heights is necessary to our survival, ensuring we are cautious in situations where we might injure ourselves. To study this, researchers set up a platform surrounded by a transparent material, giving the illusion of a cliff, and put young children on the platform to test their reaction. They found that most infants didn't try to move onto the transparent section, suggesting that they inherently avoided risking a drop. As our ancestors explored the world, this fear ensured they were wary of climbing to dangerous heights.

POISONOUS CREATURES

While we may not be terrified of them from birth, evidence suggests that we are predisposed to detect and recognise spiders and snakes quicker than non-threatening animals. One theory is that our early mammal ancestors, evolving in a world dominated by reptiles, needed to identify and react to snakes to avoid becoming dinner. Another hypothesis is that our ancestors evolving in Africa coexisted with a number of poisonous spider species for millions of years, so being able to spot and avoid them was a vital skill.

FIGHT OR FLIGHT

How your brain and body trigger this evolutionary survival instinct

Under normal circumstances, sensory information from your body is sent to the thalamus in the brain. The thalamus relays these signals to the cortex and the hippocampus for further processing, to provide a better understanding of what you're experiencing and put it into context. This analysis is forwarded to the amygdala, which triggers an appropriate emotional reaction to the situation.

When your brain receives signals that indicate some kind of danger, the course of action is slightly different. The process above still occurs, but this higher-level analysis takes precious time. The fraction of a second it takes to fully understand what's happening might be the difference between life and death. To make sure your body is instantly

prepared to face a threat, the thalamus also sends the raw sensory information via a shortcut, directly to the amygdala.

As soon as the amygdala is alerted, it signals the hypothalamus. This part of the brain activates systems that release around 30 different hormones into the bloodstream. One hormone in particular, adrenaline, causes a variety of physiological reactions all around the body. For example, in the lungs it makes smooth muscle cells relax, expanding the air passages so more oxygen can reach the blood. It also stimulates cardiac cells so the heart beats faster, and makes muscles in the eyes contract to dilate the pupils. The physical changes produced by this sudden flood of hormones make up what is known as the fight-or-flight response. This instinctive reaction gets you ready to either take a stand and defend yourself, or escape to safety.

Not many of us experience life-threatening situations day-to-day, so more often than not our fight-or-flight response is triggered by a false alarm. The moment of panic that you feel after hearing a loud bang, for example, is because neural signals from the shortcut reach the amygdala first. The fight-or-flight response automatically kicks in before the brain evaluates the situation, just in case. Once the amygdala receives more information and concludes that you are not in danger, it signals the thalamus to stop the fight-or-flight reaction, returning your body to normal.

The human brain is an incredible organ, and one that is hard-wired to prepare for the worst; it might seem silly to treat every loud noise as a danger, but if the threat turns out to be real, this overreaction could save your life.

FEAR ON THE BRAIN

What happens when the brain goes into survival mode?

THALAMUS

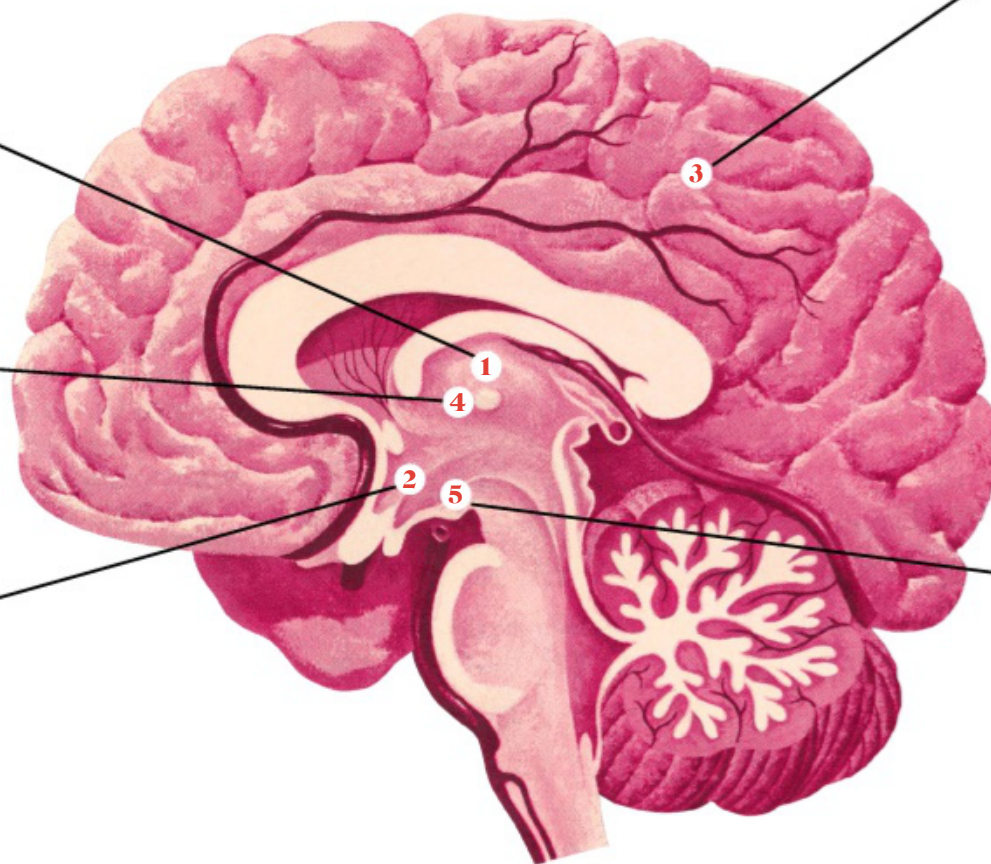
The thalamus is the first port of call for most sensory signals from the body. It relays this information to the relevant areas of the brain, like a switchboard.

HYPOTHALAMUS

The hypothalamus's primary role is to maintain homeostasis - keeping the body in a stable condition. It also regulates the secretion of hormones and initiates the fight-or-flight response.

AMYGDALA

The amygdala processes our emotional reactions and plays a role in decision-making and the formation of memories. It moderates our responses to events that affect our survival.



SENSORY CORTEX

Specific regions of the brain analyse the sensory information from each of our different senses. They process the signals passed on from the thalamus to give them meaning.

HIPPOCAMPUS

The hippocampus plays an important role in long-term memory formation. It compares incoming sensory information to past events to help establish a context for the situation you face.

1 STIMULUS

When a potential threat is detected, the thalamus sends signals to the amygdala via two different pathways. One route is fast and direct, while the slower path analyses the situation and decides what should happen next.

2 ACT FIRST

The first pathway immediately assumes there's danger even if there is none - a safer option than vice versa. It goes directly to the amygdala, which sends signals to the hypothalamus to initiate the fight-or-flight response.

3 ANALYSIS

The same information is sent along the more investigative route. Signals from the thalamus are sent to the sensory cortex, which interprets the data, followed by the hippocampus, to analyse the context of the situation.

4 FIGHT OR FLIGHT?

The hypothalamus activates both the sympathetic nervous system and the adrenal-cortical system to trigger the fight-or-flight reaction. The impulses and hormones produced prepare the body for action.

5 JUDGEMENT

Once the situation has been analysed by the longer pathway, the hippocampus sends signals to the amygdala to either seize the fight-or-flight response if there is no danger, or to maintain it if there is.

ANATOMY OF FEAR

The extreme reactions that occur when your body is put on high alert

WIDE-EYED

The pupils dilate to let in more light, so you can take in more of your surroundings and identify the threat.

GOOSEBUMPS

As your muscles tense up, the small hairs on your skin are forced upright. This evolutionary reflex probably helped our hairier ancestors look bigger and scarier.

RESPIRATION INCREASES

Faster breathing sends more oxygen to your muscles to prepare them for action.

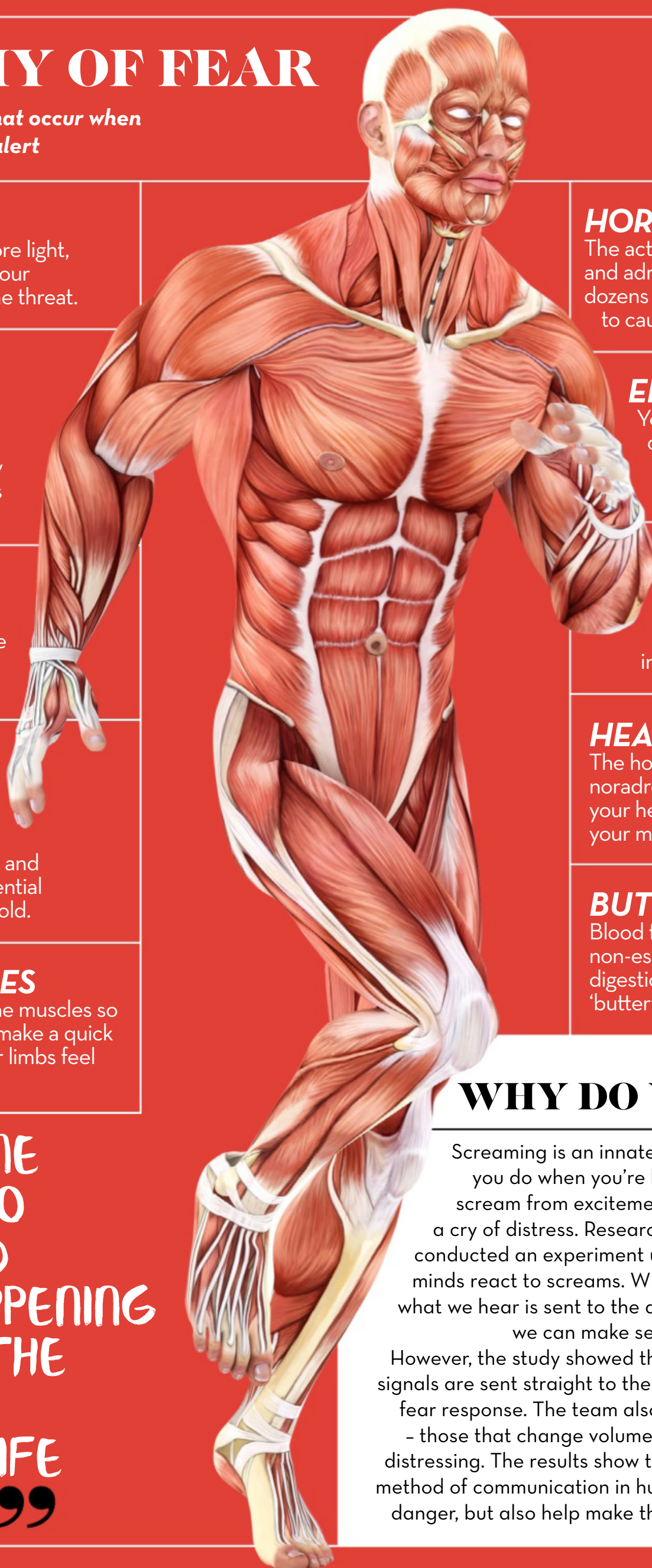
BLOOD RUNS COLD

The vessels in your skin constrict to help divert more blood to your muscles and reduce blood loss from potential injury. This makes you feel cold.

SHAKING MUSCLES

More blood is pumped to the muscles so you can defend yourself or make a quick getaway. This can make your limbs feel tense and twitchy.

“THE TIME IT TAKES TO UNDERSTAND WHAT’S HAPPENING MIGHT BE THE DIFFERENCE BETWEEN LIFE AND DEATH”



HORMONES

The activated sympathetic nervous system and adrenal-cortical system release dozens of hormones into the bloodstream to cause changes in the body.

ENERGY BOOST

Your liver starts breaking down glycogen into glucose, ready to supply the body with instant energy.

COLD SWEAT

Your body anticipates immediate action, so you pre-emptively start to sweat in order to keep cool.

HEART RATE INCREASES

The hormones adrenaline and noradrenaline are released to increase your heart rate, sending more blood to your muscles and brain.

BUTTERFLIES

Blood flow is diverted away from non-essential systems such as digestion. This causes the nervous ‘butterflies in your stomach’ feeling.

WHY DO WE SCREAM?

Screaming is an innate reflex; it’s usually the first thing you do when you’re born. Although we might also scream from excitement or pleasure, it is most often a cry of distress. Researchers from New York University conducted an experiment using brain scans to see how our minds react to screams. When we listen to normal speech, what we hear is sent to the auditory cortex for processing so we can make sense of the sounds.

However, the study showed that when we hear a scream, the signals are sent straight to the amygdala to activate the brain’s fear response. The team also found that ‘rougher’ screams – those that change volume more quickly – were the most distressing. The results show that screams are a very effective method of communication in humans. They not only help convey danger, but also help make those who hear them more alert.

ARE FEARS GENETIC?

Your phobias could be passed down through generations in DNA

It was previously assumed that all irrational fears are learned through personal experience or taught to us by others. In cases where a person develops a phobia related to a traumatic event in their past, this is most likely the case. If somebody nearly drowns while swimming in the sea, for instance, it wouldn't be surprising if they develop aquaphobia, the fear of water. The brain makes a connection between the situation and the feeling of pain and panic, and commits it to memory.

However, it is now thought that some phobias have a genetic origin. Identical twins are more likely to share the same irrational fears than non-identical twins, even if they are raised apart from one another.

Experiments with mice have shown that fears they develop can be passed down to

their children and even their grandchildren. The mice were conditioned to fear the scent of acetophenone – a sweet-smelling chemical. Researchers found that the pups, and even the grand-pups, of the conditioned mice were startled by the scent too.

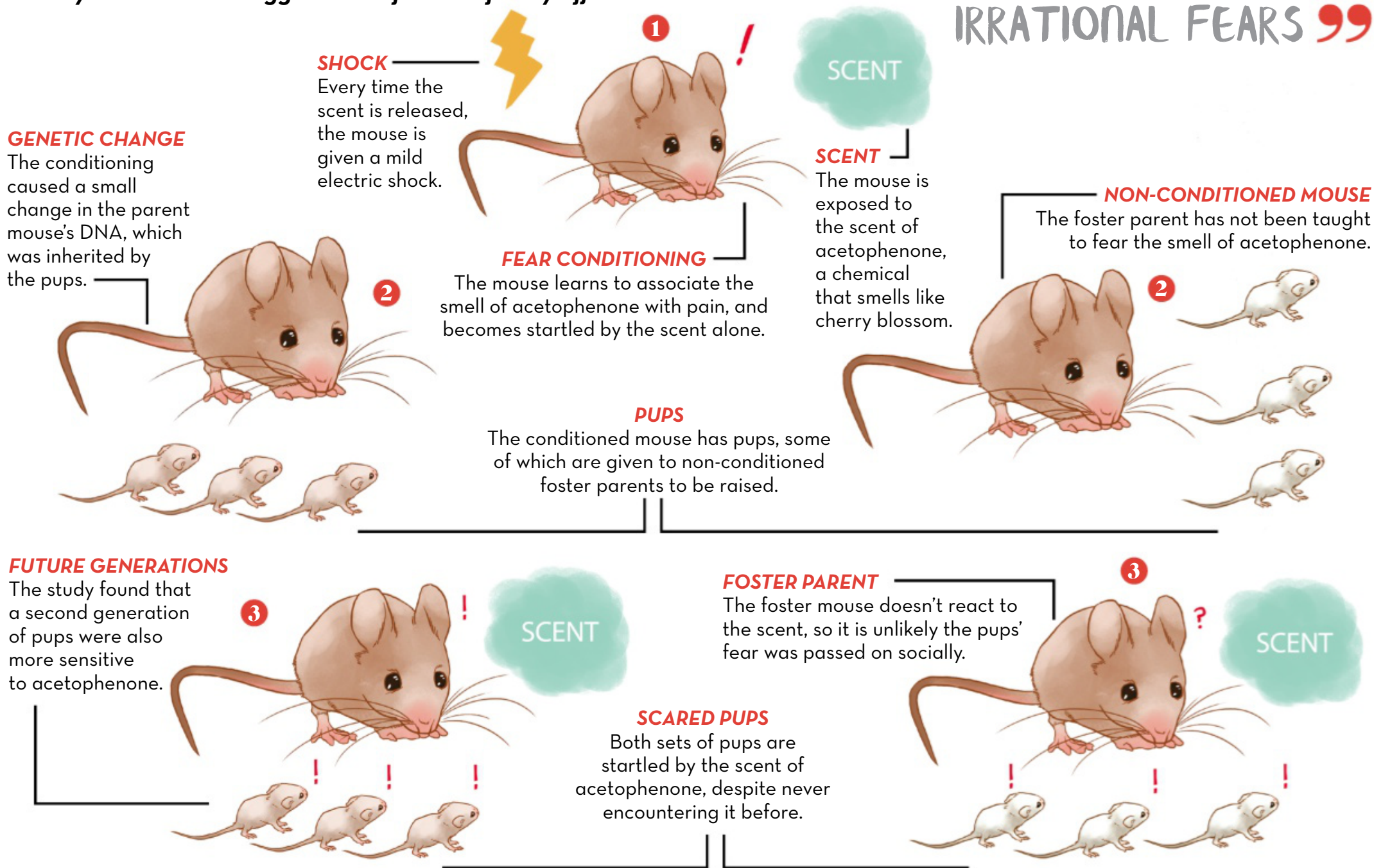
One explanation for this could be that parent mice communicate with their pups to effectively teach them what to fear. Studies have found that when mice are scared, they release pheromones that act as an alarm signal to other mice. However, in the acetophenone experiment, the pups proved to be sensitive to the scent from the very first time they encountered it. What's more, some pups of conditioned mice were fostered by non-conditioned mice. The non-conditioned foster parents were not afraid of the scent, but the pups were, suggesting the fear's origin was genetic rather than social.

It is not clear exactly how the conditioned fear is passed on to future generations of mice, but the current theory is that it is down to something called epigenetic inheritance. The original conditioning process leads to chemical modifications that change gene expression (which genes are switched on or off), without changing the DNA sequence itself. The researchers found that the conditioned mice and their offspring developed more scent receptors in their brains compared to non-conditioned mice. With more of these receptors, they can detect the presence of acetophenone at lower concentrations and so are alerted to it more easily.

Epigenetics is a relatively new area of research, but it stands to reason that fears and other memories may well be inherited this way in humans too.

INHERITING FEARS

A study with lab mice suggests that fear is a family affair



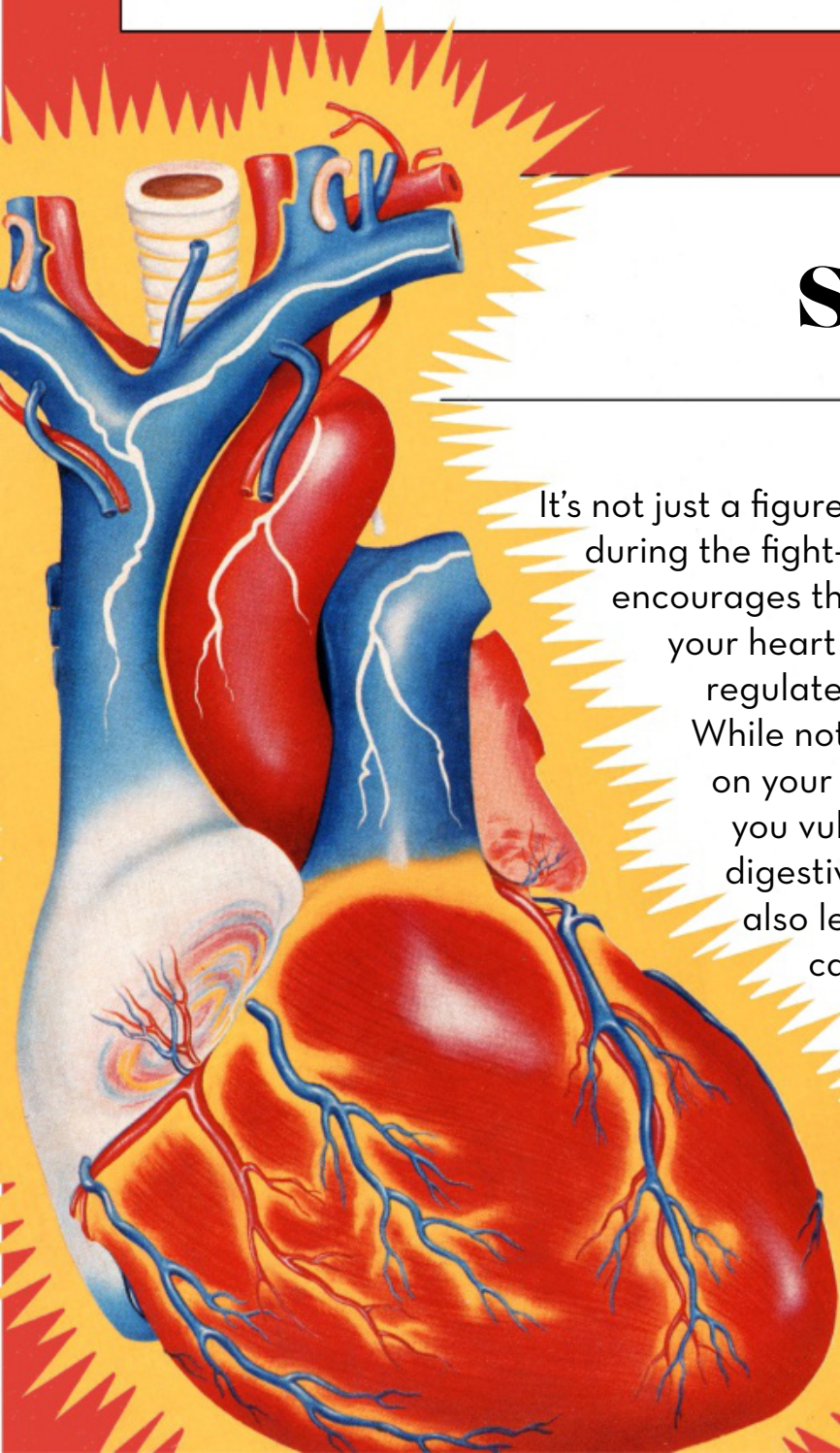
LIVING FEARLESSLY

Self-help gurus and motivational posters encourage us to be fearless, but in reality a life without fear would be incredibly dangerous. Studies have shown that when the region of the brain called the amygdala is damaged, people are more likely to take risks. Severe damage can even leave people with no sense of fear whatsoever – which can land them in some pretty scary situations! For the past 25 years, scientists have been studying a patient (known as SM for anonymity) who lacks an amygdala. SM has experienced many traumatic events in her life – she has been held at both knife and gun-point, and was nearly killed during a domestic violence attack – but she did not react with any sense of desperation or urgency, even though her life was in danger. Researchers took SM to an exotic pet store where, despite claiming she hated them, the snakes and spiders captivated her. Scientists noted her curiosity and compulsive desire to touch some of the more dangerous creatures, following repeated warnings from staff. The researchers concluded that SM's inability to detect or react appropriately to threats likely contributed to her disproportionate number of traumatic experiences. By studying patients like SM, it is hoped that scientists can understand more about fear, and discover new methods of helping people whose lives are plagued by it. For example, treatments that target the amygdala could benefit those who suffer from post-traumatic stress disorder.



SCARED TO DEATH

It's not just a figure of speech – it turns out you really can die of fright. The adrenaline released during the fight-or-flight response can be damaging in large amounts. This stress hormone encourages the heart muscle to contract, but if your body releases too much adrenaline, your heart is unable to relax again. Adrenaline can also interfere with the cells that regulate your heart rhythm, causing it to beat abnormally, which could be lethal. While not directly deadly, prolonged anxiety can have a significant negative impact on your health. The fight-or-flight response suppresses the immune system, leaving you vulnerable to illness. Going into survival mode on a regular basis can lead to digestive disorders as this non-essential system is repressed. Long-term stress can also lead to weight issues by disrupting the metabolism; elevated levels of cortisol can make the body less sensitive to insulin. Muscles that are constantly tense and ready for action can cause headaches, stiffness and neck pain. The list doesn't end there; chronic anxiety has also been linked to cardiovascular problems, asthma and insomnia. Such a broad range of effects can be harmful to both physical and mental wellbeing.



FACING YOUR FEARS

Can you retrain your brain to overcome a phobia?

Some phobia triggers are much easier to avoid than others. For example, people who suffer from a fear of bats (chiroptophobia) are highly unlikely to be plagued by these creatures day in, day out. Someone suffering from a social phobia, however, will struggle to lead a normal life. There are a variety of different methods used to treat phobias.

Among the most popular are talking treatments, such as cognitive behavioural therapy and exposure therapy, which work by retraining the brain to change how it responds to a phobia trigger. The approach is essentially the opposite of fear conditioning – the patient learns to associate their trigger with more rational, positive thoughts.

Another approach being investigated is tricking the brain into treating itself. Mentalist and illusionist Derren Brown conducted an experiment on his programme *Fear And Faith*, in which he gave people with different phobias a new wonder drug called Rummyodin. One subject, usually terrified of heights, was comfortably able to sit on the edge of a tall bridge. Another volunteer with a fear of performing in public was able to go to an audition. It was revealed that Rummyodin (an anagram of 'your mind') didn't exist, and the participants had simply been injected with saline solution and given sugar pills.

The incredible results are a demonstration of the placebo effect, a phenomenon in which a fake treatment has a very real result. Scientists are investigating how this effect can be exploited to treat both physical and psychological problems.

PHOBIA TREATMENTS

EXPOSURE THERAPY

The aim of exposure therapy is to gradually desensitise the patient to the source of their phobia. The patient ranks situations from least to most terrifying. For example, an arachnophobe might place thinking about a spider at the bottom of their list, and having a spider crawl along their arm at the top.

The patient works with a psychologist to systematically work their way through the list, using relaxation techniques or other coping mechanisms until they are comfortable with each stage. The patient's brain learns to relate each scary situation to being calm, reducing their anxiety.

COGNITIVE BEHAVIOURAL THERAPY

The aim of cognitive behavioural therapy (CBT) is to change how we think about certain situations. It is thought that irrational anxiety issues are caused by a patient's negative interpretation of events, rather than the events themselves. CBT is a talking therapy that helps patients assess their reactions to situations, replacing the worry cycle with more useful or realistic thoughts. Patients' brain scans indicate that CBT reduces the overactivity in the amygdala and hippocampus associated with phobias. Studies have also shown that CBT is as effective as medication in the treatment of many anxiety disorders.

VIRTUAL REALITY THERAPY

Exposure therapy isn't a viable option for all phobias, but modern technology offers an alternative. Advancements in virtual reality systems mean that patients can now face their fears through a headset rather than in the real world. This enables patients to face any number of situations relating to their phobia, while knowing they are in no physical danger. For example, somebody with a phobia of flying can take a course of sessions – in which they board a virtual plane and experience announcements, take-off, turbulence and landing – without having to buy a plane ticket each week.



Top 10

STRANGEST
PHOBIAS**PAPAPHOBIA**

An irrational phobia of the Pope

The most common phobias stem from rational fears, but others are completely bizarre

**SOMNIPHOBIA**

The fear of falling asleep

**SOCERAPHOBIA**

An irrational fear of your parents-in-law

**XANTHOPHOBIA**

The fear of the colour or word yellow

**LUTRAPHOBIA**

The irrational fear of otters

**OMPHALOPHOBIA**

The fear of belly buttons

**HELIOPHOBIA**

Fear of the Sun, sunlight, or bright lights

**ARACHIBUTYROPHOBIA**

The fear of having peanut butter stuck to the roof of your mouth

**PHOBOPHOBIA**

The fear of developing a phobia

**TRYPOPHOBIA**

An intense fear of small holes or bumps

OVERCOMING IMPOSTOR SYNDROME

*It's a self-inflicted feeling that holds you back,
burns you out and saps your motivation – and
it's time to get it sorted*

WORDS TRISHA LEWIS

There it goes again: that nagging, negative feeling that you are barely getting away with it. Any minute now, they will find out that you are a fraud! You may have done a good job, but that was by fluke more than skill. You might have fooled them into giving you this promotion, but within weeks you will mess up and the truth will be out. It is obvious that you will never be the real deal – not like those grown-up people over there.

But what if your brain is tricking you into believing your feelings represent reality? Do these impostor syndrome feelings stand up to scrutiny?

What is impostor syndrome?

You might have heard the phrase 'impostor syndrome' before, but what does it really mean? The term first appeared in 1978, in a research article by Doctors Pauline Clance and Suzanne Imes. While the original phrase given to this set of feelings was 'impostor phenomenon', the term 'impostor syndrome'

became more widely used – perhaps because it's easier to say and spell! The problem with the word 'syndrome' is that it suggests a medical condition, when in this case it is no such thing. It is a feeling that can come and go. It is a brain trick – a 'cognitive distortion'. Doctor Clance said that in hindsight she would have used the term 'impostor experience'.

Terminology aside, what is impostor syndrome? How is it relevant to you? And what can you do about it? The first point to emphasise is that this is about feelings, not an infection or broken bone. We are talking about a self-inflicted feeling. If you are doing it to yourself, it must surely be easy to fix, right? Achievable, of course, but not easy.

With knowledge and practice, you can get a grip on the negative effects of these feelings – but never underestimate the power of emotions. In my teens, I had a record (old-school) by Maurice Albert. It was a song called *Feelings* and it was full of yearning and angst – perfect for the agony of unrequited love. I would play this record repeatedly.



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Needle off and back to the start. Feelings are powerful, and unfortunately we are highly skilled at feeding the bad ones.

What does impostor syndrome feel like?

To overcome it, you need to be able to recognise it. It's a disconnected sensation – as if you are on the outside looking in. The

others have a right to be there, but you don't. It is the gnawing feeling that if you take your eye off the ball - if you stop doing your utmost to be loved, accepted and perfect - then you will be ostracised by a jeering crowd of haters who have discovered the useless or unlikeable you. It is a feeling of embarrassment when people praise you - they are just gullible or polite. It is a feeling of surviving rather than thriving. You are not alone in having these feelings.

Jodie Foster describe it like this: "When I won the Oscar, I thought it was a fluke [...] I thought everybody would find out, and they'd take it back. They'd come to my house, knocking on the door: 'Excuse me, we meant to give that to someone else. That was going to Meryl Streep.'" However, it might not have been accepted by Meryl Streep. She too experiences impostor syndrome feelings, which she describes like this: "You think, 'Why would anyone want to see me again in »

“ SADLY, WE
ARE HIGHLY
SKILLED AT
FEEDING OUR
BAD FEELINGS ”



a movie? And I don't know how to act anyway, so why am I doing this?"

But surely it doesn't affect the likes of all-round superwoman Michelle Obama, or acclaimed *Love Actually* screenwriter Richard Curtis? Yep, them too! Even Albert Einstein described the feeling when he said: "...the exaggerated esteem in which my lifework is held makes me very ill at ease. I feel compelled to think of myself as an involuntary swindler." You see, even the best of us experience this. It is a human condition.

Away from the world of the famous, let's look at some everyday feelings that you might recognise:

I feel 'weak' when I ask for help

*I feel I need to be perfect,
or the game's up*

*I feel that I must show proof
of my capabilities*

I feel like I can't be the real me

*I feel that my achievements
are more fluke than skill*

*I feel awkward when
given compliments*

*I feel reluctant to take on new
challenges in case I fail*

I feel weary from 'faking it'

*I feel as though others in my group
[business/friends] are better than me*

I feel anxious when not in control

*I feel strangely 'alien' a lot of
the time - as if looking in
from the outside*

Do any of these feelings resonate?

“EVEN THE
BEST OF US
EXPERIENCE
IT. IMPOSTOR
SYNDROME
IS A HUMAN
CONDITION”

COGNITIVE DISTORTION

Impostor syndrome feelings are your brain distorting reality. The father of CBT (cognitive behavioural therapy), Aaron T Beck, coined the term 'cognitive distortion' to describe the inaccurate version of reality and irrational thought patterns that can lead to states of anxiety and depression. Here are some of these 'distortions' that are relevant to the feelings of impostor syndrome.

DISQUALIFYING THE POSITIVE

Giving little thought or value to positive events. Underestimating your value to others. Assuming your success is more of a fluke than a deserved outcome. Feeling awkward when given compliments.

EMOTIONAL REASONING

Giving precedence to emotional negative feelings rather than rational reality. You feel it, so it must be true.

MENTAL FILTERING

Only allowing the negative to get through your filter, and making sure your brain confirms your already present negative beliefs. You always look stupid when you voice an opinion, so that look they just gave you was confirmation of how stupid you are.

JUMPING TO CONCLUSIONS

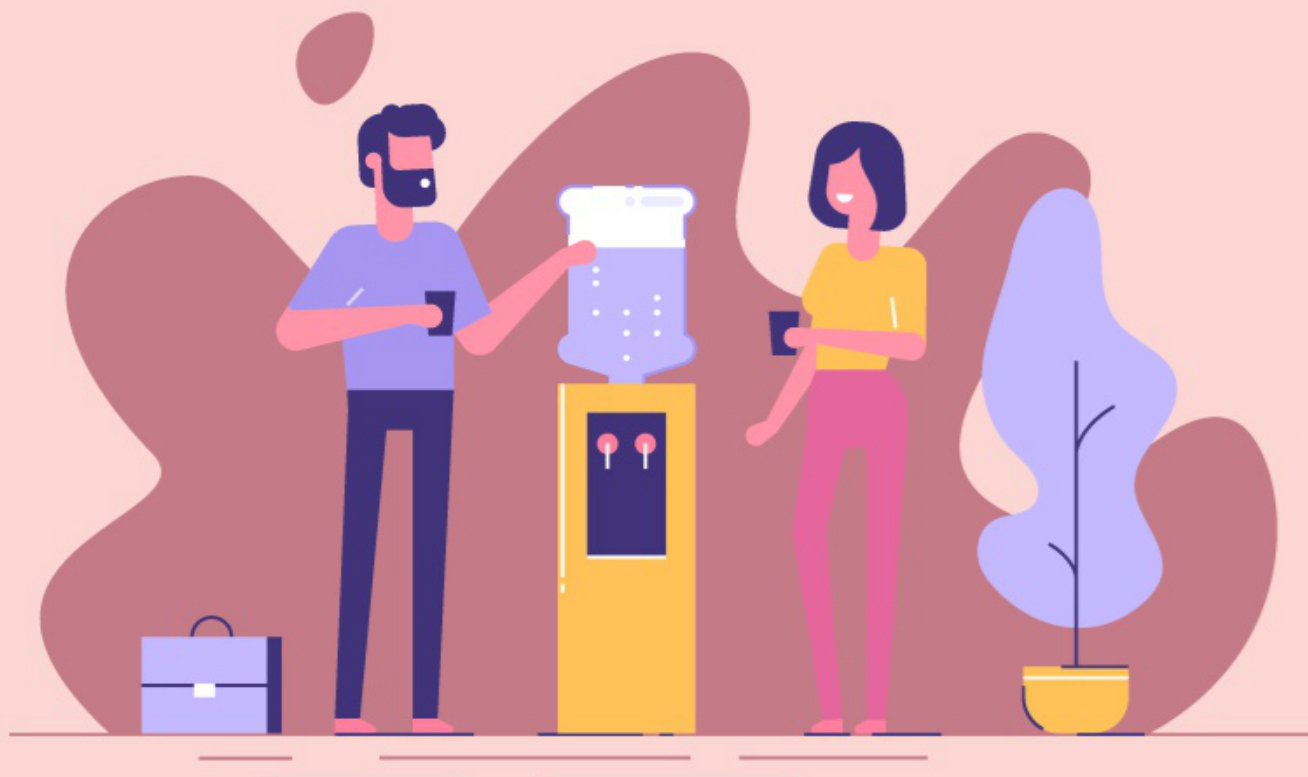
Going straight to the negative, without passing scrutiny. Acting like a mind-reader and fortune-teller.

MAGNIFICATION AND MINIMISATION

Your failure is huge; your success is tiny. The threat is massive; the opportunity is minimal. You got four out of five on that one item on the feedback form - this is the one you obsess over.

SO WHAT'S THE BEST WAY TO GET BACK TO REALITY?

The pause and reframe tactics that are at the heart of CBT are highly effective tactics to sort your impostor syndrome feelings.



What if the feelings are left unchecked?

Some feelings lead you astray, like hearing a car backfire and fearing for your life; or seeing a stranger in a café who reminds you of someone bad, and feeling anger towards them. They are very real feelings followed by responses that make no rational sense. While gut instinct can provide a healthy decision filter, blindly responding to every feeling with an action or decision can lead to negative consequences. Let's look at some of these - this should motivate you to work on reframing some of your impostor-syndrome-fed responses. I like to group the consequences into three categories:

Hide-out

Burn-out

Freak-out

This probably needs some explanation.

Why 'hide-out'? Think about it: when you are constantly doubting yourself and living in fear of being 'found out', it follows that you might keep your head down, try to blend in, agree rather than express your perspective, or even walk away from new opportunities. You are unlikely to voice your achievements and things you should be proud of - you mistakenly believe that this would come across as arrogant. Worse still, they would think: 'Wow, they are so full of themselves, and goodness knows why!'

Why 'burn-out'? You're trying too hard to please and be perfect. Perfectionism is a big symptom of impostor syndrome. There is nothing wrong with doing a good job, but if you impose ridiculous standards on yourself for fear of falling short and being found out as a fraud, well, you will burn out.

Why 'freak-out'? You become a living pressure cooker, and bottling up all those suppressed emotions is not good for you. That urge to break free and show the world

a less filtered version of you... all that effort you make to be accommodating for the sake of being accepted... all that inexplicable fear teetering on the edge of anger... In the pressure cooker of impostor syndrome, these feelings have no way of escaping - until something goes wrong and the whole thing explodes! If you never let off steam, you risk exploding at the wrong time and place, with dire consequences. You erupt in anger during a meeting, you slam a door so hard that it breaks, you hand in your notice in a dramatic outburst... you get the picture. In an ideal world, you want to avoid all these negative consequences. It's time to get your impostor syndrome under control.

Is there a cure?

Unfortunately, there is no quick fix for impostor syndrome. There is no cure because it is not an illness or broken bone as we established earlier. It is a feeling. You can't stop feelings, and you shouldn't attempt to. We feel - we are human. Many of our negative thoughts are there to protect us. We have the same brain wiring as our ancestors did back in our hunter-gatherer days. We need a healthy dose of self-doubt to prevent us regularly running into danger. However, impostor syndrome is not this kind of natural, healthy self-doubt - it is not helpful. It is a trick, an illusion - it is your own brain giving you fake news!

But how do you avoid the negative consequences of impostor syndrome? You need to acknowledge these feelings. Pay attention to them and be aware of how you respond to them. Instead of making knee-jerk decisions that are fuelled by an irrational feeling, use the pause button. It is such a relief when you discover you are in control of the pause button. You own it. The sequence is:

feeling - pause - action

Simple, but so effective.

Your action plan

There is slightly more to it than pressing the pause button, of course. What do you do during this pause? You need to get rational with your emotions. I used to think this was an impossible mix. My background is as an actor - I assumed that being too rational would squash my ability to emote. But I was wrong. Using the pause button is without doubt the top tactic - keep practising and it will eventually become second nature. I found this habit to be empowering. It was a revelation to discover that, by combining emotion with rationality, I had far more energy to drive creative thought and complete projects.

Here is how this works in practice: take the feeling and put it through the rationality filter. For example:

Feeling: I feel like a useless child in a world of grown-up professionals.

Rationality filter: Am I a child? Is everything about children useless? Who defines the word 'professional'?

Now ask yourself this: How helpful is this feeling? Only then should you proceed with the appropriate action or decision.

In summary:

1. Press pause between feeling and action

2. Put the feeling through the rationality filter

3. Act on or dismiss accordingly

Although it might feel like a slog to begin with, consciously following this sequence will become a helpful habit.

Here are some other habits to cultivate:

Ask for feedback (even when your brain is telling you to run away)

Keep a daily or weekly 'big myself up' journal

Allow the unguarded 'you' out to play

Talk to others about these impostor syndrome feelings - you are not alone

Knowledge is power when it comes to impostor syndrome - know it, make friends with it and become the boss of it. Give it a name, perhaps even draw your impostor syndrome character. Taking a step back from the nagging, negative chatter inside your head is a good feeling - a relief and a release. I speak from experience. ■



HEALTHY MIND, *healthy body*

*Becoming physically healthier and fitter
often starts by mastering your mindset
and focusing on your mental fitness*

WORDS ALISON MORGAN

We all know we can't go to the gym once and then expect that to be enough to cause a huge change to our physique or reach the result we're aiming for. You repeat something, making small changes that are sometimes hard to see on a day-by-day basis, but over a longer period all add up and make a big difference to your body.

Think of mastering your mindset in the same way, like exercising a muscle over and over to strengthen it. Aim to practise and develop mental fitness over time using the techniques on the following pages. Give it equal attention to your physical training,

exercise and movement and you'll become a mentally and physically fitter person.

Turning to neuroscience, you'll learn what's happening in your brain with all these areas:

Loving every inch of yourself

Comfort zone and change

Listening to your self-talk and beliefs

*Heartstyles - understanding why
you're doing the things you do and
how you can be more effective at life*

Habits

Self-awareness

Delving into your inner thoughts, inner self and workings can be an emotional and sometimes uncomfortable journey. You may unearth things you didn't know, can't remember or were burying deep down to protect yourself. So take your time. Be kind to yourself. Remember this is an ongoing journey - it's about learning more about yourself and taking an 'inside out' approach to living, rather than doing things because of external influences around you. Start to listen to any negative thoughts or feelings as opposed to ignoring or dismissing them. Instead, notice them, teach yourself to be curious about them, and remind yourself that thoughts are purely mental events and, as such, you are in complete control if you want to change them. Being aware of this and acting on it can gradually lead to becoming a better version of yourself, and give you some of the tools needed to attain inner happiness.

Think of nurturing the ongoing practice of mindfulness like learning to drive. Practice and repetition lead to developing a stronger skill of mindfulness, but you will also find lots of ideas on the following pages to help develop the state of being mindful in the moment.

“MINDFULLY
LISTEN OUT
AND KNOW
WHAT YOU'RE
THINKING
AND FEELING”

Loving yourself

Having a negative body-image or self-image can often lead to a place of self-loathing and self-doubt, and to experiencing a lack of self-belief and confidence. In this space, life can feel more like an uphill battle, a bit harder and not as enjoyable. It might stop you from doing and achieving all the things you really are capable of; make you feel inadequate; or cause you to seek approval and validation from others to feel better about yourself.

But we all deserve to feel good and like - or even love - ourselves, right? We only get one human body to live in and it has to carry us through our whole lives, so maybe it's better to look after it. We also only get one stab at this journey of life, so the choice is yours in terms of how to live it. Loving yourself might not be easy, but wonderful things will happen if you give it a go!

It begins with a mindful awareness of your personal body story - what thoughts and feelings do you have about yourself? We all have high and low days, but what are your recurring thoughts about yourself? Listen to them and capture them, both the positive and negative ones.

You might find they're primarily negative like: 'I'm fat and ugly and I've failed to stick to the diet again'. Or you could find positive ones such as: 'My legs are feeling strong and looking good in these shorts'. Whatever the thoughts are, the most important step is to develop the skill to mindfully listen out and know what you're thinking and feeling. Also remember that they are personal to you and so different for everyone.

Once you start to focus on and listen to your thoughts, think about this: would you say those things to your best friend? Maybe

WHAT EXACTLY IS SELF-LOVE?

It's not just about loving your bum (or any other body part), although that's a great place to start! Genuine self-love can go a bit deeper by focusing on these key factors:

Accept yourself for who you are, right here, right now.

Feel totally comfortable in your own skin.

Feel proud of who you are. Believe in yourself.

Keep promises to yourself.

Trust and have confidence in yourself.

Help and support others; don't compare or compete.

Look after yourself and do the things you need to do to feel safe and secure. Not just in terms of your health, but in all areas of life, such as your finances.

Love and accept your flaws.

some of the positive things, yes, but would you say any of the negative stuff? Probably not, so why are you talking to yourself in that way? Start to treat yourself as you would your best friend; in a compassionate, kind way. You are the only person you're going to spend the rest of your life with, so it's surely better to spend it in nice company?

It's a journey that you take from accepting yourself, to liking yourself, to loving every inch of yourself. Your thoughts and feelings may ebb and flow over time depending on different situations. You might have a baby or

be in the fittest condition of your life; things that will impact your physical body. But if you can learn the skill of mindfully paying attention to your thoughts and accepting yourself for where you are right now and being comfortable in your own skin, you will build the mental strength and resilience to help you through life and find a place of inner peace with yourself, regardless of what's happening on the outside.

Where to start

You may already be in a really secure place with yourself, practising self-love every day and feeling the benefits, which is great. If you feel you want to work more on this area and make some changes, here are some tips on where to start:

Recognise how you feel about yourself right now. What's that inner voice saying - are you beating yourself up over nothing or saying nice things?

Apologise to yourself and your body for the way you've been treating it, if you've been somewhat negative. Forgive yourself and make the decision to move forward. Being critical of yourself isn't helping anyone, least of all you.

Make a commitment to yourself that you're going to work on loving yourself. You're in the driving seat and only you can do this, so commit to it with all of your heart.

Dig deeper and understand exactly what you're saying about yourself - what's your story? Is it that every time you look in the mirror you criticise a certain part of your body, or do you have a continuing story that you'll never be able to run a marathon because you were never good at running at school? When does the positive stuff crop up and why? By understanding this, you can start to rewrite your story.

Decide what parts of your story to keep, let go of and change. Instead of thinking, 'I can never stick to a diet, I always give up after a couple of weeks', simply change your thoughts to, 'I am sticking to my fitness and diet plan, I'm feeling the difference and making progress'. Even if you don't fully believe these thoughts, you are creating new thinking patterns in your brain by simply repeating them, just like training a muscle over and over again.



What things make you feel good? If eating healthy food, a sweaty spinning session or a massage make you feel good, do more of it.

Start now. Even if you don't feel like it, just start. Change will happen. It won't be overnight but build up to it and do it in your own time.

Repeat your new thoughts and story as often as you can - it might simply be 'I love myself, I love myself I love myself'. Write it down and keep it somewhere you can read frequently.

Be more mindful of any negative thoughts cropping up. If they do, observe them and focus on how it's making you feel in your body rather than fighting against them.

Forget 'perfect', there's no such thing! Instead, focus on becoming a better, healthier, stronger version of you and be proud of your unique self!

Be grateful for what you have - the human body is amazing. What are the wonderful things that your body has done? Where have your feet carried you to or what physical feats have you achieved? Be grateful and proud of those.»

“ FIND A PLACE OF INNER PEACE WITH YOURSELF, REGARDLESS OF WHAT'S HAPPENING ON THE OUTSIDE ”

YOUR COMFORT ZONE

CHANGE IS SCARY

Setting a new goal feels exciting. You've decided to take on the challenge of running your first marathon, train for a bodybuilding competition or tackle your weight loss once and for all. However, the excitement can soon turn to fear or a feeling of being overwhelmed as we start to think about the huge task in front of us, maybe not knowing where to start. This can put us into 'freeze mode', where no action happens at all. Stepping into the unknown - doing something a little bit different, something you may not have done before, something where you don't actually know what's going to happen - can be exciting but also scary.

GREAT THINGS HAPPEN WHEN YOU LEAVE YOUR COMFORT ZONE

Staying in our comfort zone is a warm and cosy place to be. It's what we know, what we're used to and where we feel safe. Some people want to stay here and that's okay, but if you're looking to make a change and transform yourself, no matter how big or small, you have to step out of your comfort zone. Learning to overcome any fear of change is an amazing place to live our lives from.

WHY CHANGE CAN FEEL DIFFICULT

We're wired to stay in our comfort zones. Changing and doing something different, whether it's going to the gym for the first time or trying a new exercise or diet, can feel uncomfortable. Your brain resists change because it's easier to stay on autopilot and do the things you normally do, which take up less energy and also lessen pain or discomfort. It's harder work for our brains to try something new. It takes more energy, conscious thinking and work, so your brain resists. It likes to conserve energy. Our brains also seek pleasure and avoid pain. So it could be a lot more pleasurable to sit on our sofas at night watching TV than going for that run, which may potentially cause us some pain, even though we logically know it's going to benefit our health. When we talk about pain, we mean some discomfort that might be physical and emotional. So trying to figure out what pain or discomfort you might be avoiding is a great first step.

Remember when you learned something new? Maybe it was riding a bike or driving a car. The process of learning feels weird and uncomfortable and takes time to practise, and often there is a temptation to give up. However, the more you persist, practise, repeat and learn, the easier it becomes over time. By applying this same thinking and logic to the aspects you're changing with your fitness and becoming comfortable living outside your comfort zone, will help you make the changes that you want.

CHANGING YOUR WAYS

START TO MAKE CHANGES

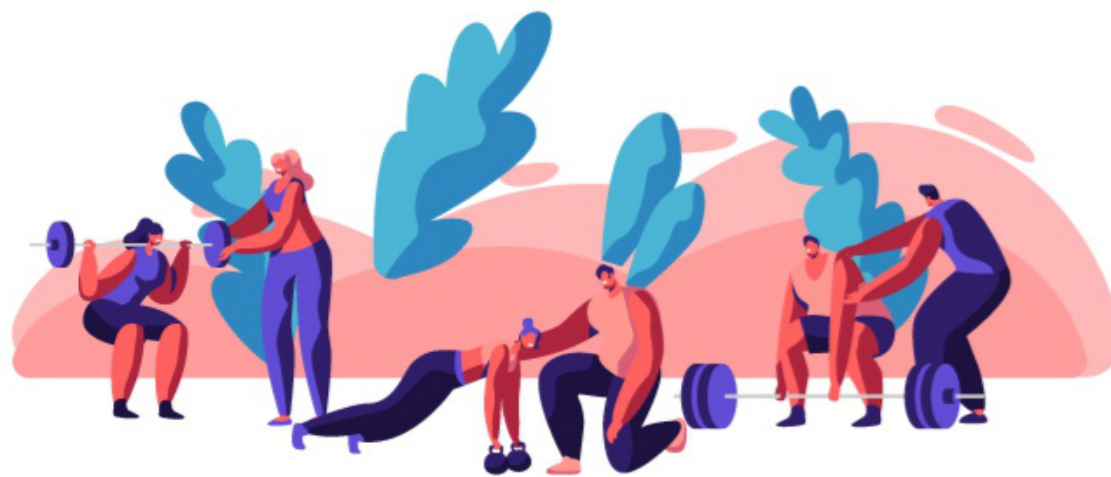
Make a vision board capturing your goal using images of what it looks like. Look at it every morning and imagine what it feels like to be positively working on and achieving your goal. Break down your goal into small actions and tasks that you can work on every day. Seeing the small steps will help reduce any fear of the goal being too big to achieve.

Celebrate your wins, no matter how big or small, and be proud of them! Think about your achievements at the end of every day – you went for that walk, cycled to work, ate nutritious foods. Whatever it is, think and feel the satisfaction and pride every day. This will release chemicals in your brain that will spur you on and keep you motivated.

Accept that your health and fitness journey is going to be full of ups and downs. We're all human, nobody is perfect, so don't give up if you stumble.

There is no failure. If something hasn't gone to plan, don't beat yourself up. Focus on learning from it – why did it happen, what triggered it, and how can you stop it happening next time? See the bigger picture with your progress. Getting on the scales or looking in the mirror every day searching for changes is probably going to leave you feeling disheartened, as changes will be small. You can't see a flower suddenly blooming, but it does happen.

Change takes time – so be patient and kind to yourself through the process!



GET OUT OF THAT COMFORT ZONE

Become more mindful of how you're feeling. Seek awareness in what that uncomfortable feeling feels like when you're trying something different or new. How does it show up in your body? Butterflies, sick feeling in the stomach, something stuck in your throat, heart beating faster...

Be okay with these feelings. Don't fight them, just recognise and be aware of them. If you battle against them or try to ignore them, it might make things worse. Sit with the feeling, pay attention to it, be curious of it, close your eyes and focus on it for a few minutes.

Go one step further – become comfortable and used to these feelings. In fact, celebrate them and make them your best friends because they mean you're changing, growing and transforming, which is a great place to be!

Thank your brain for trying to protect you and keep you in your comfort zone, but say 'I'm going to see what it's like in this new space out of my comfort zone where I haven't ventured before'.

Just do one little thing: take a tiny step. Get started, and you'll soon gain momentum.



Self-talk and beliefs

Your thoughts drive your feelings, actions and behaviours every day, often without you knowing it. The importance of developing the mindful skill of becoming aware of these should not be underestimated, whether the thoughts are positive or negative. Developing the skill to do this is the key starting point.

Cycle of thoughts

Have you ever woken up thinking it's the weekend, only to realise with a sinking feeling in your stomach that it's actually Friday, you're not getting a lie-in, and you have to get up and go to work? If you wake up feeling negative, it can cause your mind to think negatively about other things you're doing that day, like what to eat or whether to exercise. In fact, you may make different choices than if you were feeling more positive. This spiral of thoughts can become an unconscious cycle and, before we know it, we're having a really bad day, possibly even feeling anxious or depressed. You might not really understand where it's all come from as you were fine yesterday. So it's this cycle of thoughts that's driving that bad mood and negative thinking, not the actual things that are happening to you throughout your day. The good news? You're in absolute control to change it!

Fact or fiction?

Even when we're not consciously thinking much, our mind is actually busy making associations and links that are useful to us, such as songs or smells that trigger memories and feelings of moments in your past.

Our minds also create stories in our heads that go beyond the evidence or facts that we are experiencing. These stories can spiral out of control and cause moods, good or bad. Maybe you've just eaten a cake. The facts and evidence are that you've just consumed a mixture of butter, sugar, eggs and flour. But our mind might start creating a story that could be saying something like: 'I'm so terrible. I've just blown my diet. I've got no self-control and I feel fat already'. Or it could be more positive and create a story around: 'I really needed an injection of energy, that was delicious'.

Irrelevant of the story, which is personal to the individual, these stories that go beyond the facts of the situation often happen automatically and can cause problems. If you're in a negative mood, that mood may then continue to the next situation you face and affect the things you do. Maybe you make the decision to skip the gym, and get a takeaway and bottle of wine for dinner. Before

you know it, you've fallen off your fitness plan without quite knowing why.

So by being able to notice these stories, notice the evidence and put some space between your thoughts and actions, you can start to take back control and make decisions about what you're doing rather than continue your day on autopilot. Once you start noticing this and become aware of the things that trigger these thoughts, you can devise your own ways to combat them, whether it's taking a walk, calling your best friend to chat it through, or meditating - there will be something that works for you.

What's your story really saying?

Your personal fitness goal, your conscious self-talk, and the words coming out of your mouth might be saying, for example, that you want to lose weight.

For many people, this 'outside story' is different to their subconscious story. The subconscious story is often pulling in the opposite direction, and actually drives more behaviour than the outside story.

We know that our brains avoid pain and discomfort, so if you have a deep-rooted

belief, such as thinking you don't have what it takes to lose weight, your brain will avoid this pain of potential failure.

It's important to dig deep and figure out what your beliefs and stories actually are, and then work to align your outside story to your internal beliefs, ensuring they can move together in the same direction to help achieve your goals. To help with this, think about the following questions:

What is the greater pain if you don't do it?

What is the greater pleasure if you do it?

Look at everything you do as a choice. Realise and become aware that everything you do is a choice. Adjust your decisions so they're in your best interest, and perform actions that will move you closer to your goals.

Take action

Keep a journal of your stories and inner dialogue.

Ask yourself why you think you've got this negative voice at the moment. Where is it coming from? Close your eyes, listen to how you feel when you hear the thoughts.

Reframe and rewrite that story. If it's saying, 'I can't lose weight', you will always fail. Switch it to something that works for you, such as, 'I am doing this. I can and am losing weight'. Repeat it as many times as possible.

Focus on your achievements, not the setbacks. Think of and write down three things at the end of every day that you've achieved.

Often the negative talk is trying to keep you safe from hurt and in your comfort zone. So when the negative voice pops up, thank your brain for keeping you safe, but say you're going to try anyway. Maybe it'll be good, maybe it won't, but be open and willing to find out.

The practice of mindfulness will have you observe this chatter, so add a meditation to your morning and evening routine. »



“ IF YOU'RE IN A NEGATIVE MOOD, THAT MOOD MAY THEN CONTINUE TO THE NEXT SITUATION ”

Be the best version of you

We understand that our thoughts are driving the things we do. We think we're making conscious choices every day, but most of our actions are driven at a subconscious level. Being more present and aware, and pausing for a moment to understand what's really driving your actions, behaviours, thoughts and feelings, can help you to take control and start making healthy steps to becoming a better version of you. Understanding how to do this and take an 'inside out' approach to life rather than be influenced by the things around you, may create sustainable change and build your inner confidence to live life to the full.

Heartstyles is a tool used for personal development and growth that will give you a structure to identify where to start and what to do to help you on that journey of change.

A simple formula

To help understand what's driving your behaviour and actions, use this simple formula:

$$\text{situation} + \text{thinking} = \text{behaviour}$$

The situation you're in and your thoughts drive you to behave and act in the way you do, whether you're consciously aware of it in the moment or not. Often, we cannot control the situation we're faced with - we can't control other people and what they

say, for example. But we can be aware of and control our thoughts and thinking, and once we realise this and take command of it, it can have a dramatic effect on the things we're doing. You can make a conscious choice about the most effective way to act and behave that's going to contribute to you and your fitness goals, rather than just react to situations on autopilot.

Be aware of your thoughts

Our thoughts drive our feelings and behaviours. We can focus on three key areas that make up our thinking:

Triggers

-

Truths

-

Templates

Triggers

Part of our brain is constantly scanning the world around us for any threats, both physical and emotional. It's protecting us and can trigger fight, flight or freeze behaviour. Think of it as a radar that's getting triggered by things we're encountering every day. These triggers could be a time of day, a place, a smell, a person... the list is endless, but they're things that will cause you to behave in a certain way. For example, entering a gym for the first time might trigger you to feel anxious, have butterflies in your stomach and not make eye contact with anyone; walking past a specific coffee shop might trigger you to go in and buy your regular coffee and cake, which happens on autopilot.

Truths

Our truths can be thought of as a set of beliefs that we've created over time about ourselves and others. When we're born, we have no beliefs. It's through experiencing life that we develop our belief system - beliefs that help us, but may also hold us back. What beliefs do you have about yourself and your health and fitness? It might be you weren't a great runner at school so have a belief that you'll never be able to run ten kilometres. It could be you have a belief that having a healthy diet keeps you full of energy to enable yourself to do everything you want to do in life. Start to question whether your beliefs are the actual truth. Having a belief that you can't run ten kilometres isn't probably true. If you put a bit of focus, effort and learning on how to build up to running that distance, the chances are you'll be able to!

Templates

A template is an experience that's happened to us (both positive and negative), and if it was significant enough at the time, it will be stored like a file in an area of your brain called the limbic system. Think of it like a filing cabinet of memories. When you enter into a situation, your limbic system tries to work out whether the situation is familiar and whether you've experienced it before so you can work out what to do and how to act. However, as clever as our brain is, this can cause problems, because we misinterpret the environment around us, so even if it's not a perfect match to a previous situation, our brain says 'that's good enough', and can sometimes fill in details that haven't actually happened.

Negative templates can hold us back from living to our potential. We might have experienced nasty comments about our body or weight in the past that have stuck in that filing cabinet in our brain, which might mean you avoid exercise through fear of receiving hurtful remarks again. Being aware of how your brain functions in this way will enable you to start understanding more about your behaviour, so you can begin to make different choices about the things you're doing. »

“TAKE CONTROL
AND START MAKING
HEALTHY STEPS
TO BECOMING A
BETTER VERSION
OF YOU”





IS YOUR BEHAVIOUR AS EFFECTIVE AS IT CAN BE?

We move in and out of being effective and ineffective all day long. The more we become aware of what we're doing, the more we can spend time doing effective things that help us move towards our fitness goals quicker and in healthier ways.

EFFECTIVE BEHAVIOURS

Effective behaviours come from a place of courage, humility and personal growth, or a place of love, respect and developing others. These are extraordinary places to live your life from and the aim is to be here as much as possible.

See the blue and red boxes on the next page.

INEFFECTIVE BEHAVIOURS

Operating from an ineffective place isn't bad, and in fact it's quite a normal place to operate from, but it's simply not serving you to live in your potential. Ineffective behaviour can be doing things because of fear and a need to protect yourself, or from a place of ego or negative pride where you're doing things to promote yourself.

See the green and orange boxes on the next page.

So how does this relate to your fitness journey and what might some of your behaviours look like in each of the quadrants? Take a look at the examples on the following page to help bring each quadrant to life. Be honest with yourself and think about what behaviours you might be doing that are ineffective and effective, and which box they might fit into.



Effective

HUMILITY

The blue quadrant is all about making things happen and learning, so you can achieve your goals with a spirit of humility and openness. Humility gives space for your heart, mind and character to grow. It's showing the spirit of courage and personal growth.

For example:

You are clear on your goals and working towards achieving them.

You are focused on learning and becoming knowledgeable about what you need to do to become fitter and healthier.

You show courage in trying new things and pushing yourself outside of your comfort zone.

You are reliable, consistent and committed to yourself to take the right actions.

LOVE

The red quadrant of love can be described as passion, caring, loyalty, respect and honour. There are different types of love. People love sport and food in a different way to how they love their partner or children. Love is supporting those around you, helping them learn and being compassionate. For example:

You support and encourage others around you in getting healthier and fitter.

As well as learning yourself, you share your knowledge and the things that you're learning with others.

You don't judge others, but show compassion to them and seek to understand what's going on in their world.

You have a 'we're all in it together' mentality, and feel comfortable with showing people the real you.

PRIDE

The green quadrant of negative pride can also be called ego. The prison of pride attaches itself to having to prove yourself, be overly competitive and strive for perfection. It leaves no space for growth, and blocks reaching your potential. This is where your behaviour becomes all about 'me, me, me' and promoting yourself. For example:

You compare yourself to others and compete against them at all costs, trying to get one up on them, rather than focus on yourself.

You plan and control everything you do down to the finest detail, and then stress when something changes.

You are striving for perfection, and constantly beat yourself up for not doing enough.

You focus on what you haven't done rather than the achievements you've made.

FEAR

The orange quadrant of fear is deeply rooted in our humanity. The fear of others' criticism, being wrong and failure are all examples of how fear can hold us back. Fear can overwhelm and you become trapped by it. You are protecting yourself, which leads to hiding and passive behaviour. For example:

You're afraid of failing or looking stupid so you avoid taking action and put things off.

You can be overly sensitive to remarks about you and what you're doing, and take things very personally.

You seek out nice comments and approval from others, maybe posting photos on social media for the 'likes' and to get validation.

You're constantly focused on what others think and do, rather than the right thing to help you achieve your goals.

Ineffective

YOUR BEHAVIOUR

It might be you're learning how to do judo for the first time and throwing yourself into the experience of being coached a new skill. Try to have a balanced view of some of the effective and ineffective things you're doing, as it's often easy to just focus on the negative.

This image shows a full page of white paper with horizontal ruling lines. The lines are evenly spaced and extend across the width of the page. There are no margins, text, or other markings on the paper.

Time for action

Work through these steps to put together an action plan to help you change, to become more effective, and to be the best, healthiest and fittest version of you possible!

Identify the behaviour that you want to change.

What situations do you get in that cause that behaviour?

What triggers you to behave in that way?

What can you do to change?

Example:

BEHAVIOUR

I'm always comparing myself to other people's bodies in the gym and on social media, and I always feel inadequate. This makes me want to give up, so I often avoid exercise and criticise myself in the mirror.

SITUATION

I feel like this when I'm in the gym and looking through Instagram.

TRIGGER

Being next to someone in the gym who's got a better body than mine. This happens especially if my confidence is low.

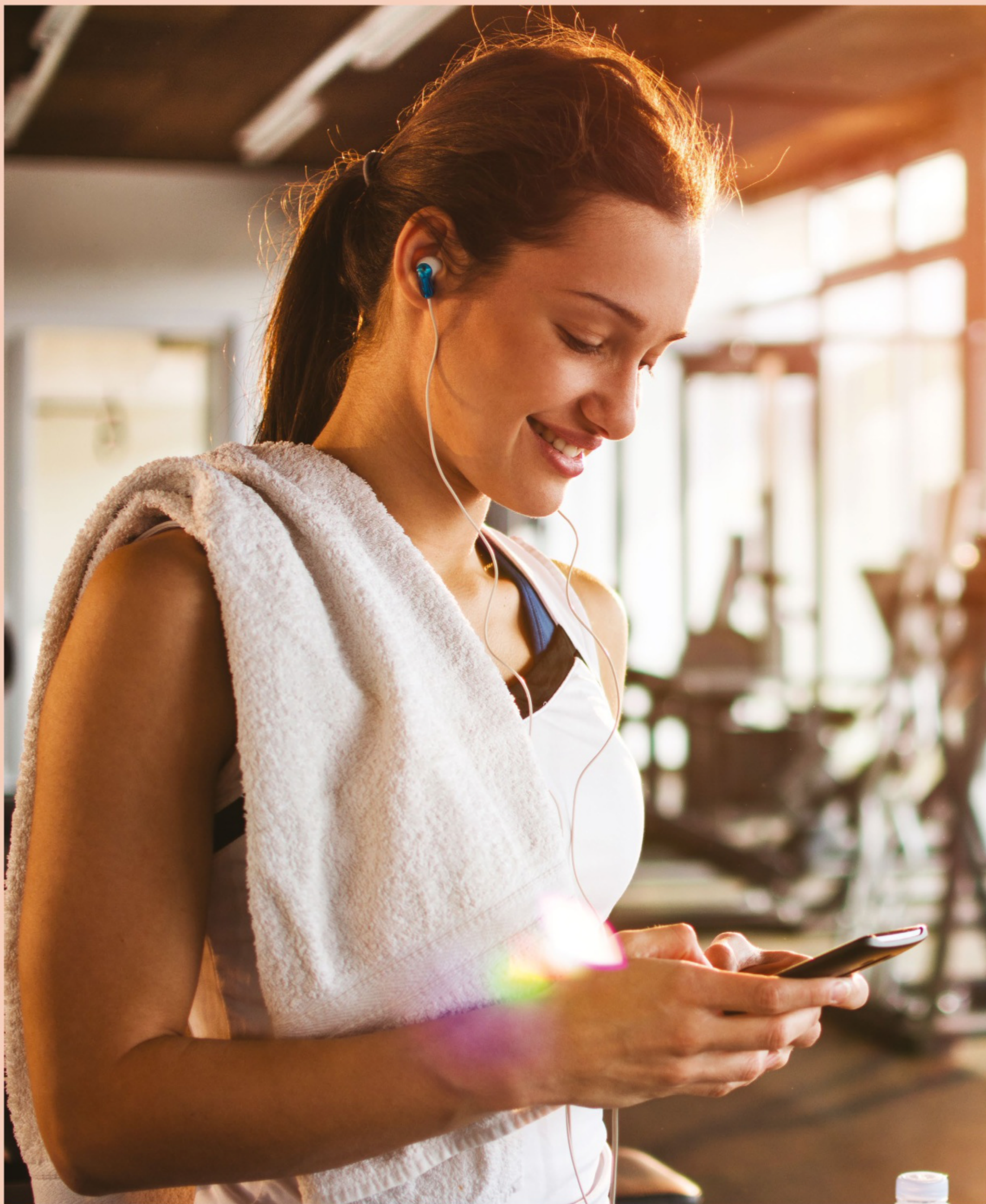
ACTION

I will stay more focused on me and what I'm doing. I will learn the right exercises and follow the right nutrition plan, which will build my confidence. I will remember that the people I'm comparing myself to may also feel inadequate. I'm going to work on my self-talk by telling myself every morning that I am good enough and can do this. I will celebrate my small achievements and feel proud of what it is I'm doing. »

Heartstyles is a programme for individuals and organisations to live a more effective life from the heart. By learning more about the deep-rooted things that might be driving your behaviours, you can transform yourself to become your best self. Email alison.morgan@heartstylesconsulting.com to learn more about a personal programme, or visit www.heartstyles.com.

“PUT TOGETHER AN ACTION PLAN TO HELP YOU CHANGE”





Habits

Habits shape our lives and control a lot of our actions and behaviours, whether we are aware of this or not. Most of the choices we make each day feel like well-considered decisions, such as what to have for breakfast, taking your dog for a walk each evening, or collapsing on the sofa with a glass of wine to unwind after a long day at work. In actual fact, a lot of these things are habits; think of them as automatic behaviours.

At one point in your life, you deliberately chose to do something, like create your morning routine. Maybe you got a new job, so decided what time to get up, shower, eat breakfast, dress, brush your teeth and so on. The more you repeated the same things in a similar pattern over and over again, day in day out, the less you made conscious choices about the actions you were performing, and so the behaviours started to become automatic.

We develop habits because our brains are constantly looking for ways to save effort and energy. The brain will try to turn almost any routine into a habit. Remember how much effort, focus and energy it takes to learn how to do something new like drive or play a musical instrument? Habits develop to quieten our decision-making centres, so not even memory is needed to repeat a pattern of actions. If you don't need to think about something at all, it takes far less energy, and without habits, our brains would shut down from being totally overwhelmed!

The bad news

Although we might understand that habits are driving a lot of what we're doing, our brains can't tell the difference between a good or a bad one. Once a habit is created, it's also hard to change. That's why it can feel difficult to transition from sitting on the sofa every night to going running instead, and those old patterns will always remain wired into the structures of our brains. Habits never really disappear, which is great when it comes to things like driving - we don't have to re-learn how to drive every time we get in a car - but it can be a hindrance when you want to break bad habits.

The good news

It is possible to create new neurological patterns in your brain - new routines that

overpower the not-so-good behaviours. It just takes a bit of awareness, decision and repetition, but can be designed purposefully to help us.

The anatomy of a habit

When we think about a habit, we often focus on the behaviour or the routine - actions like going to the gym every morning or reaching for a few biscuits with an afternoon cuppa. But there are a few more steps going on with your habit that you need to understand in order to change it:

STEP 1

Trigger - a cue will trigger your brain to go into automatic mode and tell it what habit to use. This can be anything from a time of day, a place, an emotion, company of certain people, a visual trigger and so on.

STEP 2

Routine - the actual behaviour that happens. This can be physical but

also emotional, for example eating a cake.

STEP 3

Reward - this can be physical sensations or emotional payoffs; something that helps you work out whether this pattern is worth remembering. It could be a sugar rush from a chocolate bar or feelings of pride you might get from being praised.

STEP 4

Craving - as a habit is developed over time, your brain starts to anticipate the reward. As soon as you experience the trigger, you start expecting and craving the reward, which is where habits are really powerful in driving you to do things without you realising it.

Change and develop new habits

Although habits can't be erased, by being aware of any behaviours that aren't helping »

“ THINK
OF THEM AS
AUTOMATIC
BEHAVIOURS ”





“YOUR BRAIN WILL GO THROUGH RESISTANCE AND TRY TO PULL YOU BACK TO OLD WAYS. BE AWARE OF WHAT THIS FEELS LIKE, AND KEEP GOING”

you get fitter, and recognising what triggers those actions, you can consciously create a new pathway in your brain. Make the effort to repeat that behaviour over and over, and it will slowly become more permanent than the old behaviour.

Trying to change lots of habits at once can be challenging and overwhelming. It's therefore best to start by picking one unwanted habit you have. What habit is destructive to your health and fitness? Then follow this step-by-step process to change it – you're going to keep the trigger and reward but change the behaviour.

IDENTIFY THE HABIT YOU WANT TO CHANGE

For example, consuming too much sugar in your diet, especially chocolate in the evenings.

MAKE A POSITIVE COMMITMENT TO THAT CHANGE

For example, 'I'll eliminate sugar from my diet'; not just 'I'll give up for three months'.

IDENTIFY THE TRIGGER

Is it a particular time of day when you reach for a sugar hit, perhaps the mid-afternoon slump or after dinner? The trigger could be the smell of doughnuts as you walk past your favourite doughnut shop. Figure out exactly what is triggering you.

IDENTIFY THE REWARD

What do you get from consuming the sugar? Does it give you a sugar rush or energy?

CHANGE THE BEHAVIOUR

If the behaviour is eating chocolate after dinner, think about what you can do differently. It could be anything from going for a walk, drinking a glass of water, or calling your best friend.

KEEP THE REWARD

Choose an alternative behaviour that will give you a similar reward – often an emotional one.

REPEAT, REPEAT, REPEAT

Habit rules

Focus on the following points when trying to break a habit, and you'll start to notice changes in your life.

Change just one habit at a time. Review your progress every 30 days, and then choose another destructive habit to rewire.

Your brain will go through resistance and try to pull you back to old ways. Be aware of what this looks and feels like, and just keep going.

Repeat. Do it for long enough for the new habit to take over. This needs to be at least 100 days.

Identify the real hidden reason you maintain that habit – maybe there's an emotional reason you're consuming too much chocolate, so dig deep and figure out why you're doing it.

The effort to change will feel huge, but it will get easier.

For a habit to stay changed, you must believe change is possible. Enlist the support of a friend to help you.

Changing the habit is more important than the intensity. Show up. Do something. Develop the habit.

Habits tend to work on a 'last in, first out' principle. If you're developing a new habit, it's often the easiest



one to break, for example a New Year's resolution. Stay focused, be compassionate to yourself through the process, and don't give up.

Change will happen if you believe it's possible. ■

Gratitude & WELLBEING

The simple act of focusing on the positives in your life can have a huge impact on your physical and mental wellbeing



WORDS JULIE BASSETT

Sometimes life has a habit of getting you down. There's no need to feel bad - it happens to us all from time to time. The everyday routine can become mundane, and we can feel so busy that time seems to fly by without anything really seeming to happen. It can be hard to look at the positives in your life, but there are real benefits, both physical and mental, if you take the time to harness the power of gratitude.

Recognising things and people in your life that you're grateful for can have a huge impact on your wellbeing. "Being grateful for people, things and situations in our lives can create a balanced view in our mindset and lead us to experience the abundance in our lives, rather than feeling closed, deprived and constantly striving to better our lives,"

explains clinical psychologist Dr Sarah Maynard (www.wildandpreciousminds.com). "Learning to feel grateful shows us what there is to appreciate and be thankful for in our lives right now, and can create a sense of contentment and fulfilment, without actually changing anything. This in turn can be something that lowers our stress levels and affects us physically."

This feeling of gratefulness can impact different areas in your life. For example, instead of constantly focusing on what you don't like about your body, remind yourself what it can do from a non-aesthetic perspective. You might be grateful to it for enabling you to walk along the beach, bend down to pick up a child, or take part in an exercise class. By turning your attention to these positives, you are far more likely to feel

motivated to look after your body through exercise, healthy eating and mindfulness.

Barriers to gratitude

It can be difficult to show gratitude in our lives if it's new to us. It's not uncommon to be stuck in a negative mindset, seeing the downside and struggling to embrace the good. So, how can we introduce gratitude into our daily lives? Dr Maynard says: "The best way to develop a gratitude habit is to practise little and often. This helps build the neural pathways in our brain so the habit becomes more automatic. A great exercise is the 'ten-finger gratitude practice' (finding something we are grateful for, for each finger), which stretches our thinking so we realise how much there is around us to be grateful for, both the big stuff and the small stuff."

KEEP A GRATITUDE DIARY

A gratitude diary is a great way of helping you to focus on the things you are grateful for. There is no set format for you to start a diary, though there are some you can buy with handy headers and ideas to prompt your thoughts. All you really need, though, is five minutes a day with a notepad and pen.

You really should try and write in your gratitude diary every day, which helps to establish a good habit. Write down anything good that happens in your day. You could carry it with you and journal something as soon as it happens, or you could make it a regular part of your pre-bedtime routine.

There is no limit to the things you can cover. Did you have a nice walk into work? Write it down. Did you manage a task for the first time? Write it down. It can be big things and small things. A gratitude diary is only for noting down the positives, to build up a resource that you can pull out whenever you feel down so you can look back on all the good things that have happened to you.

If you prefer a more structured approach, you could work to a set format in your gratitude diary. You could list five things that you were grateful for today, one person you were grateful for today, and one personal skill you were grateful for today. This can really help to streamline your thoughts, if that's how you work.

The key thing to remember is that this is purely personal – it is what you are grateful for. What makes you happy is very individual, and your diary is a reflection of that.

Give it a try and see if you can isolate those first ten things that you're grateful for in your life right now. If you find it difficult, you're not alone. Dr Maynard explains that there is a psychological reason why this happens: "The brain is typically able to hold on to negative thoughts (so-called 'velcro thoughts') because it determines that these may be important to our survival, whereas positive thoughts (including areas like gratitude) are so-called 'teflon thoughts' because they more easily slip right out of our minds and off our radar unless they are consciously practised."

There are barriers to overcome to embrace a life of gratitude. Dr Maynard says that when we're in a negative mindset, "it's easy to convince ourselves there is nothing good in our lives worth being grateful for, or anything significant to include." This is limiting our ability to show gratitude and it takes practise to let go of this negativity: "If we buy into this thought, we stay stuck. If we get a bit of distance from this thought and recognise 'this is just a thought', we become free to look for things we are grateful for, regardless of whether such thoughts are present or not."

Start to feel grateful

If you would like to introduce gratitude into your life, Dr Maynard has some tips: "Look around you; there is always something to »



“BE THANKFUL FOR WHAT YOU HAVE; YOU’LL END UP HAVING MORE. IF YOU CONCENTRATE ON WHAT YOU DON’T HAVE, YOU WILL NEVER, EVER HAVE ENOUGH”

- OPRAH WINFREY -

be grateful for. Maybe it's simply the fact we are alive. Anything or anyone that brings pleasure and wonder into your life, be it the blue sky, or your committed partner, can be something to be grateful for."

Once you start consciously seeking things you are grateful for, you suddenly start to realise how much good there is around you. It can be worth starting a gratitude diary (see the box below) to list the things you are grateful for each day.

There are so many benefits to being grateful. Those who practise gratitude daily might experience better sleep - one technique is to run through all of the things you are grateful for or everything that was good about your day just before you go to sleep. This puts you in a positive mindset for a good night's sleep, so you can wake up feeling refreshed and ready to face a new day.

As you practise gratitude daily and start to feel the benefits, pass it on by showing your gratitude towards others. “Demonstrating and voicing gratitude towards others can take them by surprise!” says Dr Maynard. “However, it opens up the opportunity to show others how much we value them, and in turn cultivate a more reciprocal exchange of appreciation towards each other. Being grateful also creates a ripple effect; if someone has been the recipient of gratitude, they may be more likely to pass this on in their interactions with others.” Whether it’s through writing letters, sending flowers or a verbal expression of appreciation, it’s well worth sharing your gratitude.

Make today the first day you consciously show gratitude for the good things and people in your life, and see how it impacts on your wellbeing. 🍁

“ ONCE YOU
CONSCIOUSLY
SEEK THINGS
YOU ARE
GRATEFUL FOR,
YOU REALISE
HOW MUCH
GOOD THERE IS
AROUND YOU ”

**WRITE DOWN ALL THE THINGS
YOU ARE GRATEFUL FOR**

[illegible]

WHY DO WE sleep?

Humans spend nearly a third of their lives asleep, but no one knows what sleep actually does

WORDS STEPHANIE PAPPAS

Going without sleep will literally make you psychotic and, eventually, kill you. It's clear that shut-eye is crucial to the body's ability to function, but no one really knows what sleep does. "It's sort of embarrassing," said Dr. Michael Halassa, a neuroscientist at New York University. "It's obvious why we need to eat, for example, and reproduce... but it's not clear why we need to sleep at all." We're vulnerable when we're asleep, so whatever sleep does, it must be worth the risk of the brain taking itself mostly offline. There are a few theories about

why we sleep, and although none of them are totally solid, a few try to explain what happens each night, pulling in research on topics ranging from cellular processes to cognition. Researchers say it does seem clear that sleep is key to the brain's ability to reorganise itself - a feature called plasticity. Plasticity is involved in our learning and memory.

Although it's unclear exactly how, plenty of evidence suggests that losing sleep can cause problems with memory, particularly working memory, the process that allows people to hold information in an easily accessible way while working out a problem.

People who are sleep-deprived also struggle with choosing what to pay attention to and regulating their emotions. In the future, a better understanding of sleep may come from research on the brain's supporting cells, called glia cells.

These brain cells, whose name literally means 'glue', were once thought to be largely inert but have been recently discovered to have a range of functions. Glia cells may control the flow of cerebrospinal fluid throughout the brain, which could result in clearing out metabolic waste during sleep, for example. ■



Facial EXPRESSIONS

*Embarrassed? Amused? Humans
share dozens of different expressions*



WORDS TIA GHOSE

Ask a woman from a remote village in Bhutan to act as if she's embarrassed, amused or awed, and - chances are - a teenage boy in the United States would be able to guess exactly what emotion she was portraying.

Human beings have dozens of universal expressions for emotions, and they deploy those expressions in recognisable ways across several cultures, recent research finds. That number is far greater than the range of emotion previously thought to be similar around the world.

For decades, scientists have held that there are six basic human emotional facial expressions: happiness, sadness, disgust, fear, anger and surprise. But several years ago, Daniel Cordaro, a psychologist at the University of California at Berkeley and Yale University, began wondering if there were more. He spent hours studying people's reactions in real-life situations and in videos, such as children opening presents. He noticed that despite cultural differences, many more-complicated expressions seemed similar across cultures.

To test the idea, Cordaro and his colleagues showed people from four continents a one-line description of a story (which the researchers translated into the various native languages), such as 'Your friend just told you a very funny story, and you feel amused by it', or 'Your friends caught you singing along loudly to your favourite song, and you feel embarrassed', then asked the participants to act out this emotional state using no words.

When the researchers shared those emotional re-enactments with people from foreign cultures, the viewers could match 30 facial and vocal expressions to the associated stories with better accuracy than if they had simply guessed. Interestingly, expressions of sympathy, desire and coyness didn't seem to translate across cultures.

The team also compared people in China, Japan, Korea, India and the United States when re-enacting these emotions, then coded 5,942 of their facial expressions. This meant meticulously recording the positions of 25,000 different facial muscles. "We found these incredible patterns: There are lots of similarities in how people are producing these expressions," Cordaro said. Some

expressions were incredibly similar across cultures, whereas others, such as the sound "aww" to react to something cute, were not universal. But most of the people initially studied in this research belonged to cultures largely linked by television, smartphones and other technology, meaning that the emotional expressions examined may not be truly universal.

So Cordaro and his colleagues trekked to a remote village in Bhutan that outsiders had never visited. The researchers asked the villagers to pair vocal tracks with a story that was being described. For 15 out of the 17 vocal expressions, the villagers could pick the corresponding situation at rates that were better than chance. The findings suggest that a vast part of the human emotional repertoire is universal, and that emotional expressions go far deeper than the six basic ones previously described by researchers. But the findings shouldn't underplay the role of culture, according to Cordaro. "Each emotion boils down to a story," he said. "Culture teaches us the stories under which we use these emotions, but look underneath them, there will be some theme." ■



© Getty Images



THE SCIENCE OF STRESS

*What happens to your
body when it's put
under pressure?*

WORDS LAURA MEARS

The man who first defined stress, Hans Selye, once told reporters: "everyone knows what stress is, but nobody really knows." From a mental health perspective, stress describes the feeling of excessive emotional pressure. It can manifest itself as anxiety, trouble sleeping, altered eating patterns, destructive behaviour, headaches or muscle pain. This is the stress we are all familiar with. But, from a broader biological perspective, stress is the body's response to any kind of disruption, whether it's psychological trauma, extreme temperature, lack of food, or confrontation with a predator.

There's no proper medical definition of stress, but when it comes to biology, it describes any threat to the body's normal balance. In order to cope with that threat, whether it's real or imagined, the body takes steps to protect itself. The bloodstream floods with chemical signals that heighten awareness, increase heart rate, quicken breathing, dull pain, and even induce euphoria. At the same time, non-essential functions like digestion and growth slow right down. When the stress response is activated, surviving becomes the key concern; the future becomes less important.

The brain kick-starts the stress response. The amygdala, which deals with emotion and

fear, sends a message to the hypothalamus, setting off a chain of electrical and chemical messages that prepare the body to respond. The first step is to put the nervous system into 'fight or flight' mode. It does this by signalling to the adrenal glands to increase production of adrenaline.

This chemical messenger surges into the bloodstream, triggering a wave of energy release by raiding the body's stores of fats and glycogen. Blood sugar rises and fatty acids are released to fuel the body in its time of need. These molecules are then shuttled to the muscles and brain by the bloodstream. Blood vessels in non-essential areas constrict, heart rate increases and breathing becomes faster, diverting extra resources to the places that need them most. Senses become heightened and the brain is put on alert. This response happens instantly, sometimes even before the conscious brain has processed it.

Depending on the situation - and the individual - the exact pattern of these chemical surges differs. If escape or confrontation is not an option, another response, known as 'aversive vigilance' might replace 'fight or flight'. Under these circumstances, movement stops, and blood is diverted away from the skin and extremities to the organs in the core.

Rather than revving the body up for physical activity, this response helps to minimise bleeding in case of injury. Though most stresses we experience now don't carry a risk of physical harm, this would have been useful in our evolutionary past. Which response is chosen varies on circumstances, but individuals are more likely to favour one or the other, and it's thought that these patterns are set early in life.

At the same time, a slower but more persistent stress response is also activated. The hypothalamus pumps out a molecule called corticotropin-releasing factor (CRF). This is the trigger for the biological response that puts the body into survival mode. From the hypothalamus, CRF hops a short distance through the bloodstream to the pituitary gland, where it triggers the release of a second, longer-range chemical message. Known as adrenocorticotrophic hormone (ACTH), this molecule travels around the body in the bloodstream, reaching the »

**“ SURVIVING
BECOMES THE
KEY CONCERN ”**

THE STRESS RESPONSE

The body has a well-tuned system for dealing with the first signs of stress

1. HYPOTHALAMUS

This part of the brain is responsible for maintaining balance in the body, and it kicks off the stress response.

2. PITUITARY

This pea-sized organ produces many hormones, including the stress messenger adrenocorticotrophic hormone.

3. ADRENALS

These glands are found on top of the kidneys, and produce steroids in response to stress.

This chemical messenger carries the stress signal from the hypothalamus to the pituitary.

5. ADRENOCORTICOTROPIC HORMONE

This hormone travels through the bloodstream, carrying the chemical message to the kidneys.

6. CORTISOL

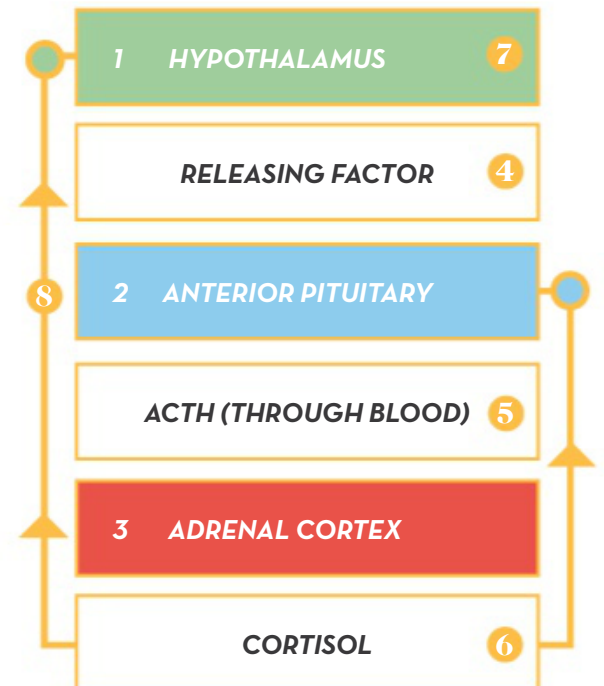
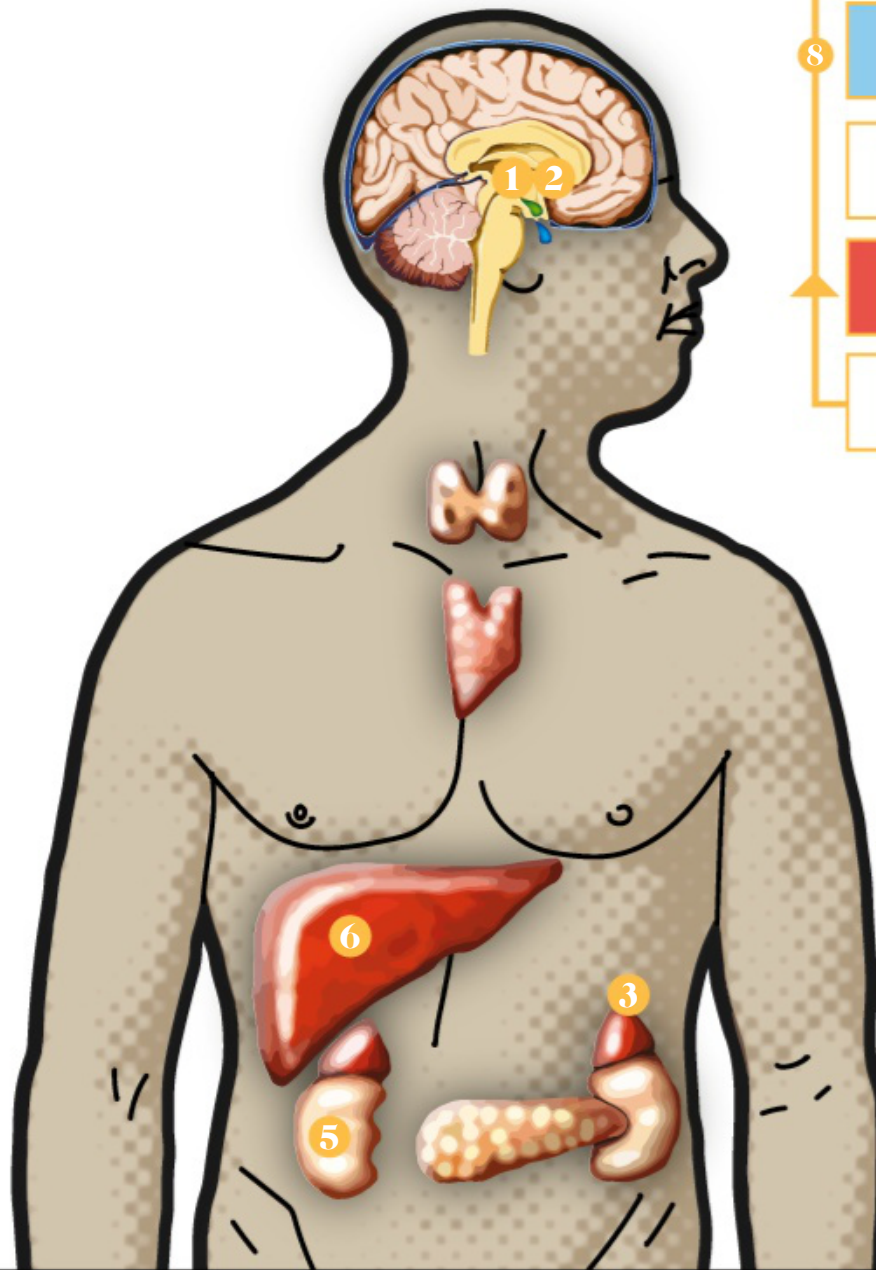
These natural steroids trigger changes across the body, helping it to deal with stress.

7. ACTIVATION

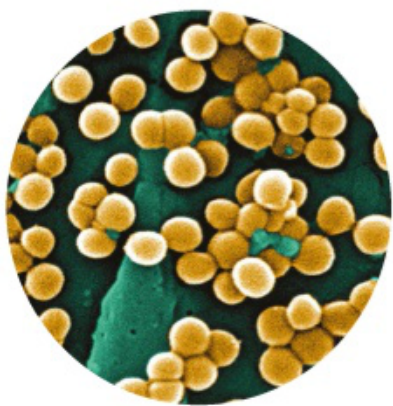
Several areas of the brain feed into the hypothalamus, triggering the stress response.

8. SUPPRESSION

High levels of glucocorticoids in the blood feed back to the brain, switching off the stress response.



STRESS ISN'T JUST HUMAN



BACTERIA

These microbes cope with changes to their environment by altering the way they use their genes. Molecules called sigma factors change which genes are switched on, and which are turned off.



PLANTS

Water stress can be a real problem for plants, so they respond by conserving moisture. This includes producing rapid chemical signals that close the pores in their leaves.



FISH

Fish have a similar stress response to other vertebrates, with a cycle of chemical signals that starts in the brain, preparing the body to release energy and shut down unnecessary activity.



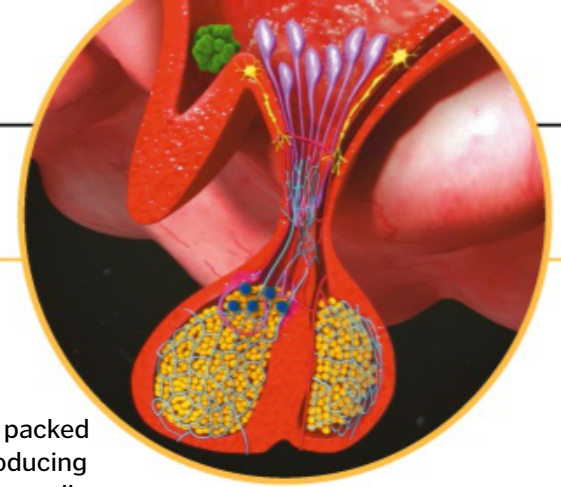
BIRDS

Like us, birds make corticosteroids in response to stress. The amount goes up in birds that breed in higher places, which helps them to cope with the risks associated with nesting at high altitudes.



MICE

These rodents are often used as a model for human biology, but recent research showed that they are stressed by male scientists. The effect seems to be related to their smell, and it may skew the results of tests.



The pituitary gland is packed with hormone-producing endocrine cells

THE EFFECTS OF STRESS

Too much stress can have a negative effect on different parts of the body

BREATHING

An increased breathing rate can result in panic attacks and hyperventilation.

HEART RATE

Raised heart rate and blood pressure can cause gradual damage to the cardiovascular system.

RESPIRATION INCREASES

Faster breathing sends more oxygen to your muscles to prepare them for action.

NERVES

Stress during brain development can affect the structure of the growing brain.

MUSCLES

Tense muscles in the head, shoulders and neck can lead to headaches.

HORMONES

Stress hormones like cortisol affect cells all over the body, including dampening the immune response.

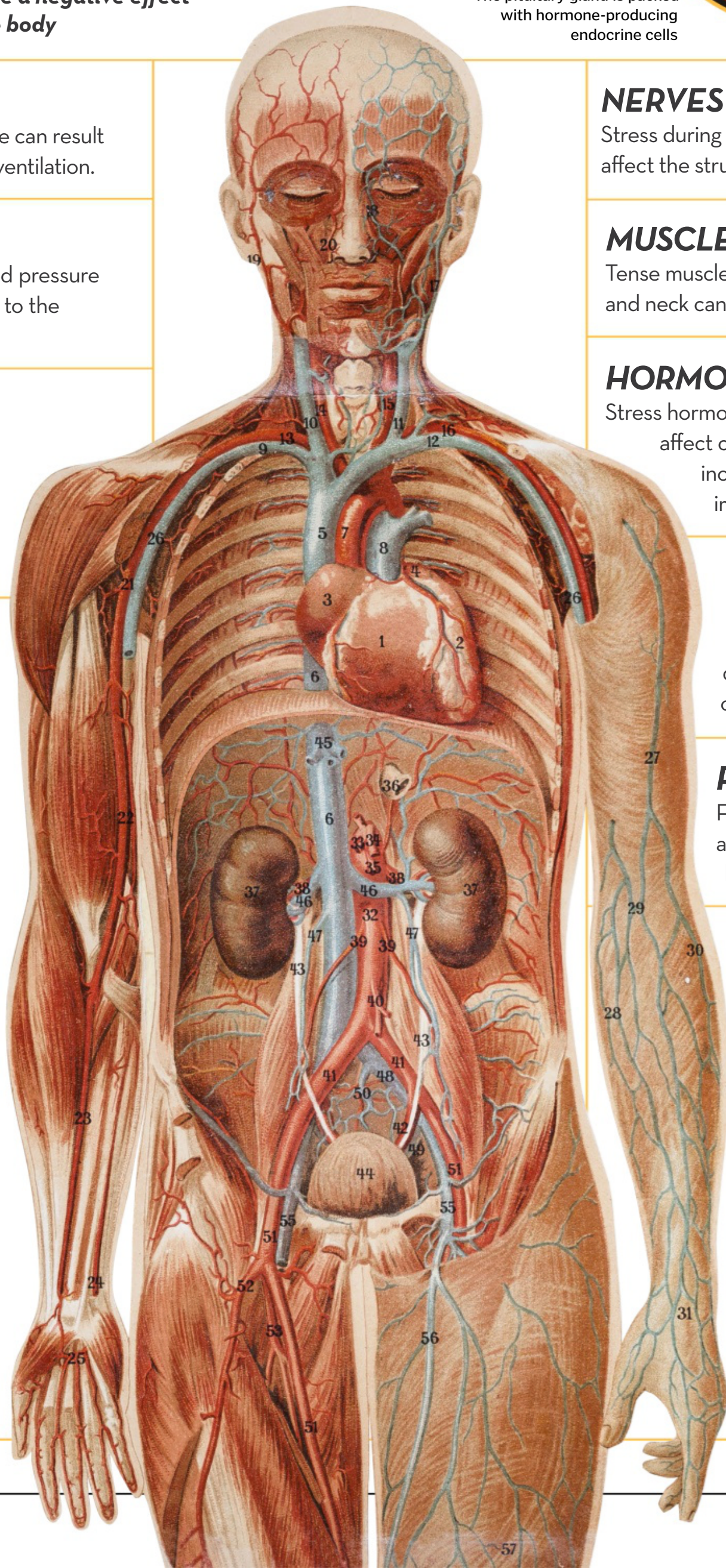
DIGESTION

Changes in blood flow to the digestive system and different eating patterns can affect bowel function.

REPRODUCTION

Fertility and libido can be affected by chronic stress in both men and women.

“IT TURNS OUT THAT IF WE BELIEVE THAT STRESS IS BAD, IT IS MORE LIKELY TO DO US HARM”



kidneys, where it triggers the next step in the stress response process.

On top of each kidney is a hormone factory known as an adrenal gland, and within each is a compartment known as the adrenal cortex. The cells here produce glucocorticoids, the body's natural steroids. And it's these steroids that help the rest of the body to deal with stress. Cortisol interferes with insulin, helping to keep blood sugar

levels up. It helps to balance the body's pH; it dampens the immune response; and it even affects the formation of memories.

Short-term stress is quickly corrected by the body, and, to prevent the cycle continuing forever, the cortisol also acts as an off switch. It feeds back to the brain, letting it know that the stress response has been fully activated, and helps to switch off the production of CRF and ACTH. But

sometimes, stress can develop into a long-term, chronic problem.

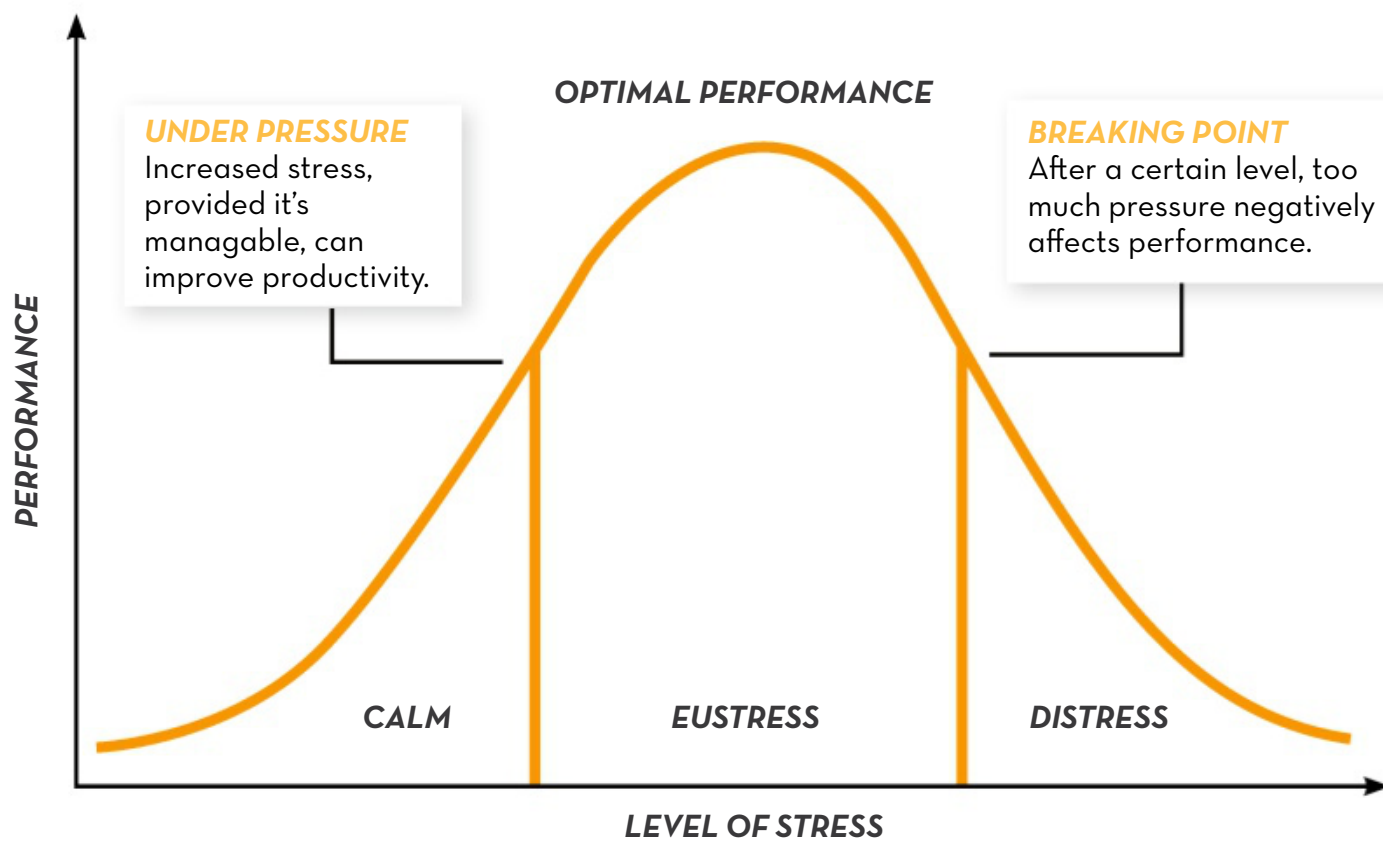
Humans are unique among animals (as far as we know) in that we think abstractly about the world and ourselves. Our huge brains are a gift, but can also lead to long-term stress as we worry over problems that just wouldn't occur to other animals, like work and money.

While the stress response has been honed by evolution to boost the chances of survival during short periods of increased environmental pressure, in the long term it can cause damage. Ultimately, it can lead to illness if left unchecked.

Exposure to stress during childhood, be it war, neglect or even divorce, can make »

EUSTRESS VS DISTRESS

How can stress levels affect our ability to work?



GOOD STRESS?

In 1936, endocrinologist Hans Selye wrote a letter to the scientific journal *Nature*, describing the “general alarm reaction of the organism.” He was one of the first people to identify and investigate biological stress. He continued his investigations, and after nearly 40 years of research, Selye came to the conclusion that stress wasn't all bad.

People had known for a long time that there's a link between 'stress' and productivity. In 1908, two researchers, Yerkes and Dodson, showed that there's a sweet-spot, where there's just enough pressure to encourage productivity, but not so much that it becomes too much for the person to handle.

Selye was interested in the idea that the feeling of stress isn't so much about what happens to the body, but about how each individual reacts to the changes.

In the 1970s, he introduced two new words, 'eustress' and 'distress', to describe what he saw. Eustress was beneficial stress, and distress was bad.

STRESS-RELATED DAMAGE

Long-term, or chronic, stress can be bad for our health, but it's challenging to pin down exactly why. Is it to do with poor lifestyle choices made under pressure, or is there something happening inside the body as a result of a prolonged stress response?

In 2004, a research team from the US published a paper in the journal *PNAS* that investigated what happens to our cells under stress. They looked at the genetic code, homing in on the protective caps that cover the ends of each chromosome. Known as telomeres, these structures shorten as cells get older. An enzyme called telomerase can replenish telomeres, but stress diminishes the supply of this regenerative enzyme. The team studied a group of 58 women, and they found that the longer the women had been stressed, and the more stressed they felt, the more likely they were to have shortened telomeres – a sign that their bodies were feeling the strain. Exactly why this happens is not currently known.

people more likely to experience mental health problems as adults. During this period, the brain is still developing, and chronic stress can cause structural changes that affect the way that it functions. As adults, chronic stress puts strain on the heart and blood vessels, contributing to cardiovascular disease, heart attacks and strokes, and it can also damage the immune system.

During an acute stress response, immune cells are mobilised in case they need to fend



off infection, but the stress steroid cortisol affects their function in the long term. In fact, drugs based on cortisol are used to dampen down the immune system in patients in need of immunosuppression.

Long-term stress can be a real problem. Not only does the response itself put pressure on the body, but coping mechanisms, including drinking and smoking, can all damage our insides. However, it's not just about the physical effects. 'Stress' is a loaded word, and recent research has been looking at how our perceptions of stress affect its impact on the body. It turns out that if we believe stress is bad, it is more likely to do us harm.

Studies in the US have shown that people who are stressed have an increased risk of dying. But - and this is critical - only if they believed that stress itself could cause them harm. In fact, people who were stressed but didn't believe it was bad for them had a lower risk of dying than those who were barely stressed at all.

The negative connotations of the word 'stress' bothered Hans Selye, who had first pointed out the stress response in the 1930s. Part of the trouble is that stress isn't just used to describe the body's response to challenging situations. In physics, strain

is the change in shape or size of an object as a result of an external force, and stress is the internal force associated with it. The use of the same word links the two in people's minds.

Astonishingly, changing the way you think about stress seems to be able to change the effect it has on you. Seeing sweaty palms, increased heart rate and rapid breathing as signs that your body is trying to help you alters your internal response. Heart rate still increases, but blood vessels can stay relaxed, which is much better for the cardiovascular system. What's more, there's another component to the stress response that is often overlooked: oxytocin.

Popularly known as the 'cuddle hormone', oxytocin helps mothers to bond to their babies, and it's released by the brain when we are hugged. It is also produced during stress, helping us to seek social support. Oxytocin also helps by dilating blood vessels, lowering blood pressure and even helping to repair the heart.

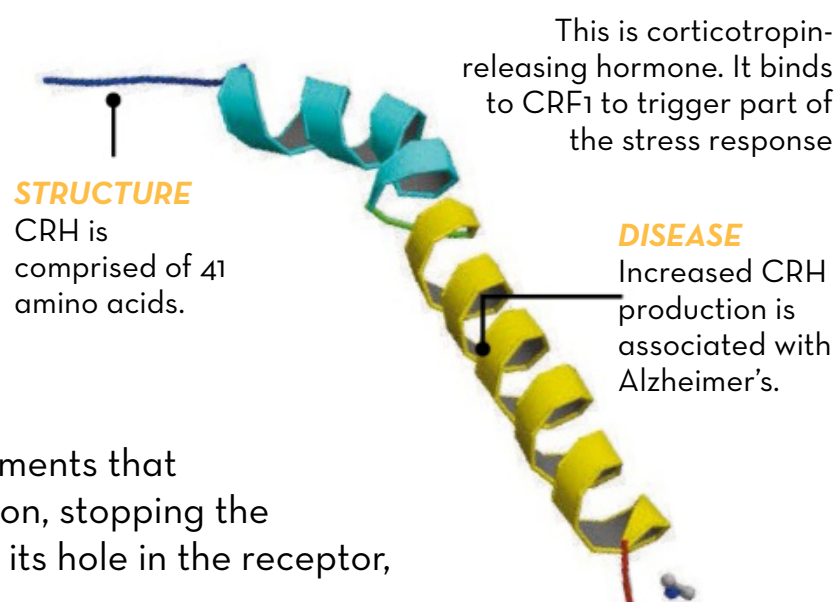
While stress can feel unpleasant, it is there to help us deal with life's challenges. Believing in your body, and seeking support when things become too much, can help keep it under control. ■

BLOCKING STRESS MOLECULES

The hypothalamus is the part of the brain responsible for kicking off the stress response, and it does this by producing corticotropin-releasing factor (CRF). This hormone travels to the nearby pituitary gland, where it tells the cells to begin pumping out adrenocorticotrophic hormone (ACTH), which in turn tells the kidneys to make the stress steroid cortisol. One of the critical molecules in this pathway is known as CRF1: corticotropin-releasing factor receptor 1. It is the molecule that detects the CRF, and in 2013, scientists managed to work out its shape.

CRF1 sits on the surface of cells in the pituitary, and other structures in the body, and waits for CRF to arrive.

When it does, the hormone sticks to the receptor and triggers molecular pathways that contribute to the stress response. Understanding its shape could help drug developers to design treatments that interfere with this interaction, stopping the hormone from slotting into its hole in the receptor, dampening the stress.



MONITORING STRESS

The tech that can tell if you're having a tough time

There are several electronic gadgets that claim to be able to track your stress levels by tapping in to your heart rate, breathing, skin conductance and blood oxygen. The idea is to help you to identify, and avoid, your stress triggers. However, although some of the science behind the measurements they take is sound, it's not always easy to decipher what they mean. For example, the time between heartbeats varies less when you are stressed, but also when you are excited. A device that picks up on these changes won't be able to tell you which mood you are in unless it knows what else is happening around you.

DEALING WITH DISTRESS

There are several coping strategies that can help to combat stress



BELIEVE IN YOUR BODY

Some studies have shown that stress is more harmful if you believe it is harmful. Trusting that your body is preparing you to cope helps to minimise damage.



TAKE CARE OF YOURSELF

Some people seek comfort in damaging activities during times of stress, but nicotine, alcohol, food and other addictive substances don't help the underlying problem.



TRY MINDFULNESS

Stopping and focusing on the present moment through meditation or mindfulness can help to change the way that you think and feel.

EXERCISE

The fight or flight response prepares your body for activity, so use up that nervous energy by exercising. Exercise also releases natural endorphins that boost your mood.



TALK

People are social creatures, and the phrase 'a problem shared is a problem halved' didn't come out of thin air. Seeking support can help to reduce stress.



HELP OTHERS

Going out of your way to help other people when you are already stressed might seem counterintuitive, but it can help to give you purpose and perspective.



MAKE A PLAN

Sometimes there are things you can't change, but identifying the areas that you can and making a realistic plan to tackle them can help to guide you through stressful times.



KEEP A STRESS DIARY

Noting down the things that trigger feelings of stress can help you to prepare for them in the future.



MANAGING stress IN THE WORKPLACE

Understanding generational divides can significantly reduce unnecessary stress across teams and departments in your business, thus improving morale, performance and profitability

WORDS PAULA THOMPSON

As a business grows from a startup to an SME (small or medium-sized enterprise), the owner can be very hands-on and rather knowledgeable of their employees. This helps the owner to match individual personalities and skills for the good of the business. However, the larger the business, the more difficult this becomes.

There has been much written about the different traits each generation brings to the workplace. Baby Boomers were all about being at their desk or place of work before their start time so that the boss would see them when they arrived, and they would still be there when the boss left to go home! In general, Millennials have a completely

different take on it. Everything is done but not necessarily when the company needs it. The Baby Boomers would see each task through to a conclusion and were happy to work autonomously, whereas the Millennials need more guidance, reassurance and praise.

As I am sure you can imagine, these different generations will not always see eye to eye, which may lead to conflict. It is important to remember that even within the same generation period, you will still have employees with opposing generational traits.

People will often try to dismiss conflict in the workplace by justifying it with platitudes such as, "oh they just rub each other up the wrong way," "they don't like taking orders from the management," "they prefer to do their own thing." Problems may also be blamed on



PAULA THOMPSON
STRESS MANAGEMENT
PRACTITIONER

Paula Thompson works with businesses to identify and resolve stress in the workplace. She has a diploma in stress management from the Institute of Stress Management, and is a qualified Samaritan. With a background working within SMEs and international corporations, Paula has a wealth of knowledge and understanding when dealing with clients.

WWW.STRESSRIGHT.CO.UK



miscommunication. But if they continue to be ignored, these conflicts will lead to increased stress in the workplace.

I am not a counsellor. I work with individuals and businesses to resolve conflict areas, identify things that could cause stress for employees and - most importantly - I help employees who are suffering from stress. Even if their stress stems from something outside of the office, it is important to understand that even the strongest characters will be affected whilst at work, in one way or another.

Working with companies enables me to build a relationship with their employees,

and it's fair to say that, yes, I can always see the what, where and how conflict has led to stress. And in most cases it's relatively simple to resolve. Every generation believes that they are special and that they deserve to be treated in a certain way. A specific example is that, in general, Baby Boomers respect their peers and are workaholics, whereas Generation Y individuals lack respect for authority - especially when orders come from Baby Boomers or Generation Xs

Generational traits are here to stay, they are a factor of human evolution. These traits are driven by day-to-day experiences and shaped by global and social events. However, I should also remind you that generational traits are only part of an individual's makeup, with learnt traits being another influential factor in forming the persona of each and every one of us.

This is why I stand by my belief that you should treat everyone as an individual. To get the best out of your employee in a working environment, you should get to know their way of working and find out what makes them tick. Not all generational types will be the same, because learnt traits and life experiences will be influencing factors.

I have attended seminars and read many articles about the differing generational traits and how they can lead to conflict. There is

a detailed chart (Generational Differences Chart) which can be found online at www.academia.edu by Dionesio Caranyagan, which I found very useful when researching this topic. It is probably one of the best tools I have come across. While it doesn't include Generation Z, it does explain an awful lot about Traditionalists (those born between 1900-1945), Baby Boomers (1945-1964), Generation X (1965-1980) and Millennials (also known as Generation Y, 1981-2000). * ■

“DIFFERENT GENERATIONS WILL NOT ALWAYS SEE EYE TO EYE, AND CONFLICT CAN ENSUE”

© Getty Images

WORKED EXAMPLE

I recently had a 12-month review with one of my clients. He owns a tech style business and had been of the impression that certain teams needed to be young and tech-driven to get the results he wanted. Well, circumstances led to him employing a Baby Boomer in a supervisory role for one of these key teams. It was complete anarchy at the start, which led to several members of the team going off sick with stress. This is where I was brought in. After doing some investigative work with the team, then training them individually and as a whole, they all united. So far this year, they have been top performers in both Quarter 1 and Quarter 2. The team are now more appreciative of each other's characteristics, and morale has improved immensely, which has led to the upturn in productivity.

Having greater awareness of each other's traits means that they can avoid the triggers that used to spark the conflict. The younger team members had automatically assumed that the Baby Boomer would not understand the technology as well as they did. After my intervention, however, they realised that actually he was incredibly tech-savvy. The Baby Boomer, who believed that the younger team members were lazy know-it-alls, became appreciative of their skills and understanding of their traits. I would urge all businesses to train their employees in stress management awareness and avoidance, and include generational traits. The benefits are huge!





TALKING *without* *SPEAKING*

*Effective communication is as much to do with
our bodies as it is to do with our words*



WORDS EDOARDO ALBERT

Language is important to human beings. Indeed, it's so important that we risk our lives for it. We share the same basic vocal equipment as our nearest relative, the chimpanzee, but in order to produce a greater variety of sounds with more precision, our tongue had to get longer, moving down the throat, which led to the larynx being pushed further down and a longer neck. The downside of this is that what we eat and drink has to get past the larynx to get to the oesophagus, and when it misses and goes down the wrong tube, we choke, whereas with other animals, the larynx forms a valve to prevent this.

As evolution favours the survival of the fittest, why have we evolved a potentially fatal arrangement of our breathing and eating apparatus? It's because the descent of the larynx created an echo chamber that allowed for a vastly greater range of sounds to be produced - the sounds necessary for spoken language. Speaking is so important to human beings that, evolutionarily speaking, its value far outweighs the loss of people through choking to death.

Spoken and, later, written language have allowed human beings to develop cultures and transmit accumulated knowledge down the generations in a manner unique among animal species. Words have an

almost inexhaustible capacity to convey information. But non-verbal language is vast in scope too: close to a million discrete non-verbal signs and signals have been recorded by researchers, 250,000 of which are facial expressions. We are capable of an extraordinary range of non-verbal communication, but most of the time we are unaware of how much information we absorb through these channels.

The evolution of body language

The evolutionary importance of body language is apparent in our eyes. Look at the eyes of a dog or a cat. In normal circumstances, the white of their eyes are »

IT'S NOT WHAT YOU SAY, IT'S HOW YOU SAY IT



Far less discussed but almost as important as body language are all the varieties of speech that make up how we say what we say. Simply changing the pitch of an expression as loaded as 'I hate you', can alter it from a declaration of loathing to a recognition of a joke well executed. According to renowned voice coach Harriet Whitbread: "There are only five things you can change to make your voice an exciting instrument of communication: pitch, exploring different vocal qualities, change of pace, shaping words, and volume. Of these, the most important to use during a speech is pitch because a change of pitch indicates to the listener a new thought on the part of the speaker. Monotone speech is very difficult for the listener to understand since it suggests, at a deep level, that the words all proceed from the same thought. New thought, new pitch." In her work with teachers, Harriet Whitbread reminds them to: "Make sure your praise is, vocally, more interesting than your telling off."

not visible for the simple reason that white is easily spotted by prey. Nor are the whites of the eye visible in apes and monkeys. However, for humans, the importance of eye contact and knowing where other members of our species are looking outweighs the evolutionary disadvantage of sometimes being detected by prey or predators.

Work on which specific areas of the brain recognise body language is a continuing research area in psychology. Results so far indicate that two visual areas and the amygdala are crucial in the neurology of body language. The involvement of the amygdala in understanding body language underlies how deep rooted it is within us, for the amygdala is one of the most ancient parts of the brain and a key driver of decision making, memory and emotional responses.

The deep roots of body language

If spoken words are something we risk our lives for, then why do textbooks regularly

trot out the statistic that, in terms of communication, what we say - the words - counts for only 7% of the message, while tone of voice and other vocal qualities make up 38% of the communication, and a whopping 55% is down to non-verbal signs: body language? If we risk our lives for the ability to speak, why don't we use it more in our communication?

It's because our ability to use language is a relatively recent evolutionary development, originating somewhere between two million and 500,000 years ago. But that's not to say our ancestors did not communicate - they did, in the same way that your dog communicates with you today: through non-verbal language. This means that our ability to use, respond to and perceive body language is embedded far more deeply in our brains than verbal communication. The question remains, though: are these gestures innate, that is genetically programmed into us, or learned by observation or in some

other fashion? To answer this question, scientists have observed babies and children born blind and deaf - who could not acquire facial expressions and gestures through watching others, compared gestures and body language across cultures, and studied the body language of apes and monkeys.

Innate or learned?

Pulling this research together indicates that some aspects of body language are natural, part of the toolkit that comes with being born a human being in the same way that babies know how to suck from a nipple without being taught, whereas others are learned - with some falling into the in-between category that is language, for which we have a specific, genetic propensity but the exact form of the language depends on the particular culture into which we are born. It's good to know, therefore, that the smile is built into our genetic substance: children born deaf and blind start to smile in the same way that sighted and hearing children do. Scientists have also found that the key human facial expressions occur universally across cultures, which strongly suggests that they are innate too. These seven universally recognised expressions are joy, sadness, fear, anger, surprise, disgust and contempt. The most famous proof of this was the research by Paul Ekman, where he presented the people of an extremely remote tribe in Papua New Guinea with a simple story scenario and asked them to select the photo with the expression that best expressed the reaction of the story's hero. Even though the pictures were of westerners, the tribesmen correctly attributed the picture to the emotion.

At the other end of the scale, most hand gestures - from the obscene to the encouraging - are culturally determined, although the open palms gesture denoting peaceful intentions appears to be innate as well. It is these gestures that are liable to cause the worst cultural misunderstandings. According to body-language expert Allan Pease: "The 'OK' gesture usually means 'okay' in most Western cultures, but in France it also means zero, in Japan it means money, and in

“ KEY FACIAL
EXPRESSIONS
OCCUR
UNIVERSALLY
ACROSS
CULTURES ”

Greece it is a sexual insult. When travelling overseas, ask your host to show you the common local gestures so you avoid making cultural mistakes."

In between these two extremes there are a range of gestures about which scientists are still unsure. For instance, when a man and a woman pass each other at close quarters, the man will turn towards the woman whereas the woman will turn away from the man. We do not know whether this is innate or learned behaviour. Another interesting gender difference is how we put on coats and jackets: right arm first for men, left arm first for women. Whether this is innate or learned also remains uncertain.

What is clear, however, is that 'women's intuition' has its origin in the far greater ability women have to read body language than men. For instance, when scientists showed a silent film of a man and woman talking to subjects, the women taking part in the experiment were far better at telling what was happening between the two people than the men. This reflects a profound difference in neural organisation. MRI (magnetic resonance imaging) scans have shown that women's brains have more areas involved with decoding behaviour than men. While there is an innate difference between the

genders in their ability to read non-verbal cues, men who work in careers that depend on communication, such as actors, do score well in non-verbal understanding. Within the wider group of women, those who have raised children also score more highly, having developed their ability to read non-verbal cues from the necessity of learning what their baby wanted.

Body-language basics

Magazines are full of articles that claim to teach the reader how to read body language: the nose rub that means a lie, dilated pupils that translates to her being really interested in you, and so on. The truth is, if it was that easy, every liar would be unmasked and there would never be any unwelcome sexual attention. But body language cannot be read, reliably, in isolation. Allan Pease puts it best: "Body language is a real language which is made of words, phrases and punctuation. The golden rule is to always read body language in clusters of at least three; like words in a sentence." So if that salesperson tells you it's the best deal they've ever made and, during the pitch, briefly covers their mouth, touches their nose and scratches their neck, then they are probably trying to sell you a lemon. Similarly, if the woman whom a man is talking

to flicks back her hair, exposes the underside of her wrists and moves her handbag closer, then she probably would not be averse to being asked out on a date.

Online body language

With the shift to online communication, whole new avenues of miscommunication have opened up. Everybody can think of examples of email conversations that have become acrimonious in a way that would never have happened if the participants had been in a face-to-face conversation. Allan Pease offers some useful advice for navigating these new minefields: "Skype-type calls allow you to stare at a person and study their expression and behaviour, which is something you can't do in a real-life situation. People are more critical of you on a Skype call than in real life and are more likely to detect small movements and gestures of the face. Young people who exclusively use messaging and text should always use emojis because they convey the meaning and the feeling of the words that are being written. Without emojis, your text is likely to be misinterpreted. For example, you make a humorous quip but the reader thinks you're being sarcastic." An interesting lesson to take away in a world of online communication. ■





Reality television programmes continue to be popular, but do we ever consider what happens to the contestants when the cameras stop rolling?

WORDS JULIE BASSETT

Reality television and its impact on the mental health of its contestants have been thrust into the media spotlight. Mike Thalassitis, a former semi-professional football player, was found dead in March 2019 - he appeared on Season 3 of *Love Island* and Series 4 of *Celebs Go Dating*. Sophie Gradon, a previous Miss Great Britain and contestant on *Love Island* in 2016, died in June 2018. More recently was the death of Steve Dymond, after his appearance on the long-running *The Jeremy*

Kyle Show, which has since been removed from air permanently.

A spotlight has now been cast on whether the psychological support offered to contestants and guests is fit for purpose, even though these deaths have not been conclusively linked to their appearances on television. Jonny Mitchell, a contestant on *Celebrity Big Brother* 2018 and *Love Island* 2017, has started a petition on Change.org, with almost 90,000 signatures. He writes: "Producers can sell you the dream, pretend to be your best friend, use you for their

own agenda, push you into situations on the show and then sell the public an image of your character however best suits the show through how they edit it, and then they send you out into the world with a pat on the back and nothing more."

ITV put in place new duty of care guidance in advance of the fifth season of *Love Island*. This outlines stringent procedures that involve pre-filming and during-filming psychological support, as well as a minimum level of aftercare, including social media training and at least eight therapy sessions.



Reality TV contestant Mike Thalassitis took his own life in March 2019

“ THEY ARE BEING ACCUSED OF PUTTING ENTERTAINMENT OVER ETHICS ”

person, someone who already enjoys a large social media following and wants to boost their career - whatever the cost. “Contestants present themselves as the product. How they look and, to some degree, how they behave is the criteria of how the public judges them. They are the currency they trade for their chance of success,” explains Sally. “When they are back home, and if they are remorselessly criticised or trolled on social media, they can feel immensely vulnerable. The rejection they experience can feel like a total rejection of who they are. How damaging to their mental health this criticism feels for them is closely linked to their feelings of self-worth.”

And when you hit this low point, where is there to turn for help? Is this still the responsibility of the television show that brought about fame, or is this a larger question of access to mental health services? “We have a mental health crisis as austerity cuts bite deeper into existing sparse services,” explains Sally. “We have a climate that encourages greater disclosure, but more dialogue about mental health challenges is not supported by services that people suffering from mental ill-health can access without extended waiting times.”

If we continue to have conversations about mental health support, even within the sphere of reality television, hopefully this will help to bring about a positive impact on the provision of care for us all. ■



THE IMPACT ON VIEWERS

While the conversations on mental health are focusing on the contestants themselves, what about those of us at home watching these lives play out from the comfort of our living rooms? Reality television is often very far from being a snapshot of actual reality - it's designed to be aspirational. The contestants are usually chosen for their looks, as much as their personalities; they rarely represent a true cross-section of society. For those with their own underlying self-esteem and body-image problems, this can be difficult to watch. Constantly making comparisons to contestants and their lives that are being presented for our viewing pleasure, can have its own impact on mental health. Figures from a YouGov survey, released by the Mental Health Foundation, found that a quarter of people aged 18 to 24 find that watching reality television makes them worry about their own body image. Dr Antonis Kousoulis from the Mental Health Foundation told *The Guardian* that: “Our research clearly shows that a large number of young people say reality TV has a negative impact on how they feel about their own bodies. Concern about body image is linked to anxiety, depression and feelings of shame and disgust.” This opens up a further need for conversations about mental health and access to support to help young adults cope with these kinds of issues.

Producers have a difficult line to walk - ensuring contestants receive proper care, but also delivering a show that will be enjoyed by millions. They are being accused of putting entertainment over ethics, but surely contestants know what they're letting themselves in for?

Senior therapist and media psychologist Sally Baker (www.workingonthebody.com; @Sally_therapist on Twitter; *On the Sofa with TV Therapist Sally Baker* podcast) explains the potential issues: “Even though for many contestants their time on *Love Island* is the culmination of a dream come true, it comes with a recognised downside. The pressure and expectations from the public cannot be underestimated. For some ex-contestants, this can be a heavy price to pay and can exacerbate all kinds of existing emotional insecurities and mental health issues around self-esteem and self-doubt.”

The reference to ‘existing’ underlying issues suggests reality television is by no means the sole cause of post-appearance mental health problems. Maybe we're focusing too much on aftercare, and not enough on the selection criteria and initial psychological evaluations. Sally says: “A crucial element, in my opinion, would be to ascertain their level of resilience and ability to bounce back from emotional challenges. Focusing on resilience would recognise that life after *Love Island* might not be smooth, but that chosen contestants have the inner resources they need to overcome difficulties and emotionally thrive even when dealing with adversity.”

But why put yourself through this reality television ordeal? They attract a certain



EAT MORE *mindfully*

Start to pay more attention to the way you are eating. Once you notice patterns and habits, you'll be able to take control

WORDS ALISON MORGAN

Mindful eating is about paying attention at the time of eating and noticing what you're thinking, feeling and eating through all five senses. It's about being conscious of your eating behaviour – what you're doing and when you're doing it. Think of it as the polar opposite to eating on autopilot.

By paying more attention to these things moment by moment, we can start to make conscious choices about what we're eating, and make wiser decisions that will help us in achieving health and fitness goals. The concept of good or bad food doesn't exist in a mindful-eating approach. It's about viewing food as fuel and therefore consuming energy to enable you to function throughout the day. Different fuel is of course helpful for different things, and mindful eating isn't about being perfect all the time; rather it enables you to be in a state where you can make conscious decisions about what to eat. So mindful eating is about:

NOTICING

Be aware of what you're doing, thinking and feeling while eating.

MAKING CONSCIOUS CHOICES

Don't eat on autopilot, but be aware of what's going on in your mind so you can act more wisely and make choices.

YOUR STORY

Be aware of the stories you're creating about what, how and why you're eating. Notice any common themes, such as 'carbs make me put on weight' or 'I know these blueberries are nourishing and great antioxidants'. Once you become aware of your stories, you can start separating the story from the actual facts of the situation.

BEING NON-JUDGEMENTAL

Accept where you are right now with your fitness, health and body. Don't make any judgements about yourself for eating certain things, such as feeling guilty for eating a packet of crisps. »

TELL-TALE SIGNS THAT YOU MIGHT NOT BE EATING MINDFULLY

You have a lack of awareness about your eating behaviour in all forms – what it is you're eating, when and why you're eating.

You especially lack awareness of why you're eating, because this can link to your relationship with food and emotions.

You don't remember what you've eaten all day.

You finish a chocolate bar (or other foods) without even noticing what it tasted like.

You get to the end of the day and realise you haven't had one proper meal; you've just been grazing and snacking.

You recognise that your behaviours are out of sync with other people, maybe eating in private or not eating at all.

You're fearful of foods.

You eat when you're not hungry.



WHO IS MINDFUL EATING FOR?

Anyone has the capacity to be able to eat mindfully, to be in the moment and pay attention to what it is they're consuming. You don't need to be pre-disposed as a mindful person or even have done any formal mindfulness practice. Anyone can learn this approach to put themselves in the state of being mindful and switch off eating on autopilot. As a beginner, you can learn to induce a mindful state in that moment, and then with practice and over time, you can develop the skill of mindfulness.

“ THINK OF MINDFUL EATING AS THE POLAR OPPOSITE TO EATING ON AUTOPILOT ”

HOW TO START MINDFULLY EATING



Marina Grazier (www.mindfulness-exchange.com) explains how you can eat mindfully. “First, decide why you want to eat mindfully. What’s the benefit to you? Maybe it’s to give you a release from dieting, or the freedom to eat what you want, when you want. Be clear about what it is you’re looking to get out of adopting a mindful-eating approach, as this will motivate you to make changes and stick with them. Adopting this approach will be like embarking on a journey of change, and therefore needs some focus, attention, effort and dedication. You’ll be rewiring your brain and creating new neural pathways, so allow yourself time to adapt. Accept it will be challenging and uncomfortable before it gets easier.”

1. EXPERIENCE EATING MINDFULLY

Find somewhere quiet where you can focus.

Start to eat something, thinking about what the experience is like through all five senses.

What does it look like? Pay real attention to it.

What does it feel like in your mouth or the rest of your body?

What can you smell?

What does it taste like?

What does it sound like when you bite and chew it?

As you’re doing that, notice your emotions. What are you feeling about it? Is it joy, anger, sadness, disgust, guilt or judgement on yourself?

Notice any thoughts you have, such as ‘this tastes great/not good’ and what stories are running through your mind like ‘I’m proud to be nourishing my body with this apple’.

Developing the capacity to know what you’re thinking and feeling in the moment when you’re eating is the key starting point. Try to experience eating for what it is. The reality of eating a cake is that you’re consuming a source of fuel and a mixture of butter, sugar, eggs and flour. Your thoughts and feelings may be of guilt, or thinking it’s going to ruin your diet, so the more you can separate facts from stories, the easier it is to make conscious choices.

2. BUILD ON THIS EXPERIENCE

Build on your mindful experience and start to practise it more frequently. Do what works for you and fits in with your lifestyle, but make a plan of when you're going to practise it. Whether it's breakfast every day or one day a week, make a conscious decision and commitment to focus on eating mindfully at that time.

Use this checklist to remind yourself what to be paying attention to, and remember to eliminate all distractions!

What thoughts are you having?

What emotions are you feeling?

What sensations are you feeling?
(think about your five senses and sensations anywhere on the body)

3. LONG-TERM CHANGES

After you've been practising putting yourself in a mindful state with food on a regular basis, start to notice how it's changing your eating. Are you making better choices, are you eating less, do you notice when you're full, or maybe you only choose a bag of crisps once in a while as opposed to once a week? If it helps, keep a diary and track it over a few weeks, identifying any triggers. Often people have a powerful experience once they apply some awareness and it becomes crystal clear what's happening, so the choices are easier to make.

There are no forbidden foods because you're making conscious choices about what to have, but you can still apply principles of personal food preferences if you feel they're the right choices for you in the moment. You might start to notice a shift in your relationship with foods. You may find you don't even enjoy certain foods anymore, and can have chocolate or biscuits around the house without having to eat them.



Benefits of mindful eating

Mindful eating can give you a route to happiness that's enduring. Happiness doesn't come from the external stuff like cars, houses or being a certain weight. It comes from within, from your own experience of acceptance, self-compassion, non-judgement and knowing you're in control. Therefore if you can nurture your internal experience, you're not having to abuse your body or relationship with food to feel a sense of worth. Other benefits include:

It can flush out whether you're an emotional eater rather than eating when you're actually hungry. You can then start to tackle the root cause of your emotional distress and manage your emotions better instead of blocking them out and smothering them with food.

It can be empowering to know you are in control rather than making emotional food choices.

It can change your relationship with food as you start making wiser choices about what you eat.

It can give you liberation and freedom from food's mercy and fear of food.

It's a long-term lifestyle change and can be an alternative approach to following a restrictive or quick-fix diet.

If you can start to view food as fuel, you'll recognise when you're eating in ways that are not supporting your healthy behaviour.

It can reduce binge eating as you simply cannot eat in this way if you're being mindful. The more you develop being mindful, you can start to intercept binge-eating behaviour or learn to stop it before it starts. Through mindful eating, you begin to recognise the triggers, thoughts and feelings that are happening so you can stop, then make a choice about how to proceed.

**Developing the skill of mindful eating over time**

So how long will it take for you to start feeling the impact and benefits of eating mindfully? And how often should you ideally be practising to develop the trait or skill of mindfulness? Unfortunately, this is difficult to answer because there are many factors at play, such as the amount of time per day/week of practising, the quality of the practice, and the individual's propensity to learn. Just like learning to drive, we all take different amounts of time to learn new skills.

Recent research in workplaces where mindfulness is being trained and practised has identified benefits from practising ten minutes or more a day over an eight-week period. Psychologists argue on the length of time it takes to develop new habits, but most think it's between 30 and 90 days.

This is a great starting point for practising your mindful eating, and you should start to see benefits after eight to twelve weeks if you're practising for at least ten minutes a day. But view mindful eating as a lifestyle change and an ongoing commitment. Training and rewiring your brain is just like training your

body to change; it takes time and requires continual attention and practice. Just as with exercise, you might face a relapse where you've got a really busy period at work, with no time to prepare healthy food, so you grab a sandwich at lunch and a takeaway for dinner. That turns into two or three days and you forget the importance of healthy eating or your mindful-eating practice, so everything takes a downward spiral. It's okay! We're human beings and life happens, so don't judge yourself and beat yourself up. Show yourself some compassion, treat yourself like you would your best friend and just start again when you can. Explore what triggered you to stop so you can watch out for those signs in the future. Recruiting a friend to help and support you is always really helpful - someone you can rely on and give you moral support when these times happen. »

Marina Grazier is a psychologist and thought leader in helping people master their minds and flourish through mindfulness. She takes mindfulness into workplaces around the world, and mentors teachers of mindful eating through her business, The Mindfulness Exchange. Marina pioneers taking mindfulness to people wanting to protect their health and wellbeing in the face of our modern lives and chaotic eating behaviours. For more information, visit: www.mindfulness-exchange.com.

“ TRAINING AND REWIRING YOUR BRAIN IS JUST LIKE TRAINING YOUR BODY TO CHANGE; IT TAKES TIME ”

HOW MINDFUL EATING CAN TRANSFORM YOUR LIFE



After more than 30 years of trying different diets that only resulted in yo-yo weight loss and zero self-esteem, Helen James had to look for a different solution to end this cycle of misery. Mindful eating was that solution, and it has also led her on an exciting journey of setting up Nutriri, a not for profit organisation helping to support and educate others facing challenges concerning unhappiness with food and their bodies.

WHAT'S YOUR HISTORY WITH DIETS AND YOUR RELATIONSHIP WITH FOOD?

My 'dieting career' easily spanned three decades, from my mid-teens to early 40s. I consistently yo-yoed with my weight, which cycled incrementally between 9 stone and over 18 stone. I was often joining slimming clubs or trying more extreme crash diets. On reflection, I also probably clung to smoking cigarettes on and off too, believing that they caused me to eat less.

WHAT LED YOU INTO MINDFUL EATING – HOW DID YOU COME ACROSS IT AND WHY?

My well-meaning friends and relatives used to support my food-restriction efforts with weight-loss praise. That 'singing when you're winning' phase felt like all was well in the world because I was being successful in reducing my body size. Then I'd reach a plateau in my weight, which triggered an increase in self-loathing and, inevitably (it seemed), full weight regain. This cycle was depressing; leaving me with a real sense of zero self-esteem and a return to the 'oh sod it!' diet. Eating with moderation felt very alien and possibly something someone was born with; certainly seeming forever out of reach to a chaotic binge eater.

It was the depression and anxiety state that led me to an eight-week mindfulness course, and very early on in those eight weeks, I had the tiniest of insights into my relationship with food. I realised that I needed to stop subscribing to the belief that it was something or someone 'outside of me' that would help me lose weight, and that change can only come from inside. That tiny insight grew quite powerful; to such an understanding that I knew everyone struggling with food needed to know.



WHAT DOES MINDFUL EATING MEAN TO YOU?

To me personally, mindful eating means having an end to the chaotic food thoughts and choices; in essence, being present with what I have chosen to eat.

HOW DID YOU START PRACTISING MINDFUL EATING?

Believe it or not, I wrote a script! In the beginning it felt quite engineered and awkward. I'd have to ask the family to be quiet around the table (my teenagers thought I was losing the plot!). At first, bringing focus to each sense in turn seemed to heighten my awareness of all sounds, sights and so on, and I was labelling them as distractions. I wouldn't say I'm overly spiritual, so I was looking for a way to be practically present; cycling through each sense and noting what was there. Over time and with practice, I found it easier to be absorbed in the joy of food again, and the kids were happy that I no longer insisted on awkward silences around the dinner table!

HOW EASY DID YOU FIND THE EXPERIENCE?

Lots of us can resonate with the phrase 'I have no problem enjoying food' or 'my problem is that I enjoy food too much'. So to align mindful eating with any intention (of weight change, up or down) is to place as much emphasis on hunger signals and fullness signals and begin to view mindful eating as something to put us back in control of our food, instead of at the mercy of diet culture.

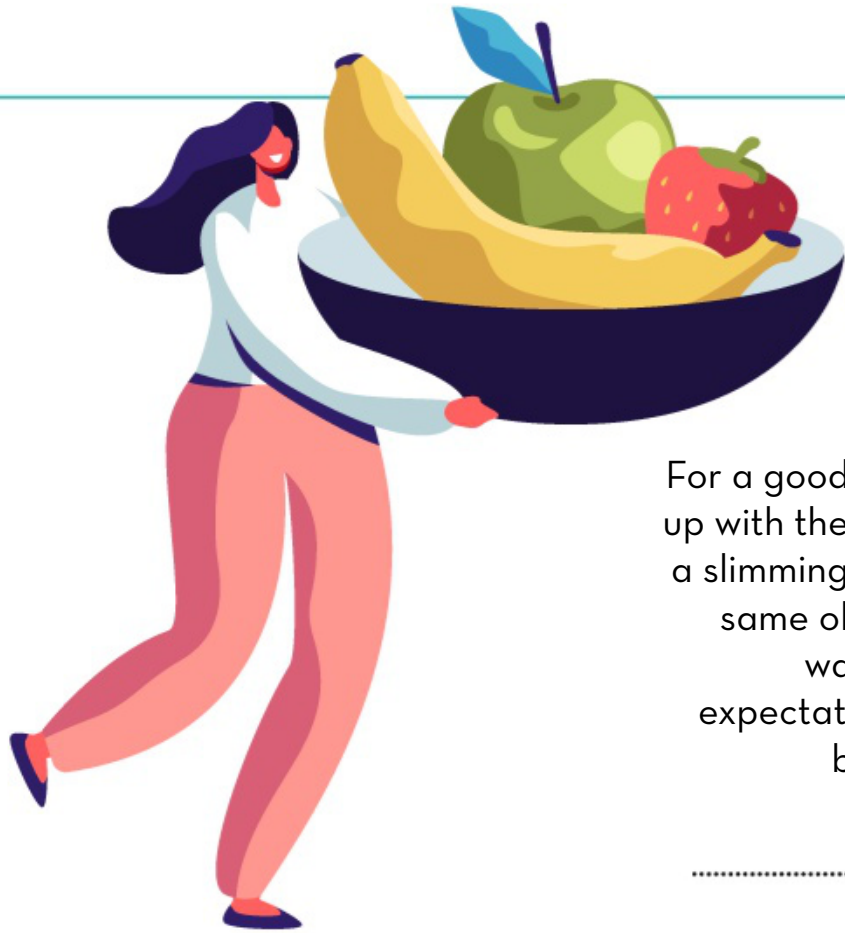
WHAT BENEFITS HAVE YOU EXPERIENCED?

I've reclaimed the hours and hours wasted each day to meal planning and miserable shopping to fit in with different family food ideals. For me it's been about overcoming disordered eating, not passing it on to our teenagers, and generally reaching a place of calm. I like myself now.

HOW EASY HAS IT BEEN TO MAINTAIN?

I've lost that 'all or nothing' mentality. That feeling of 'I'm either on a diet or I'm out of control' that fuelled my old weight cycling habits. Alongside mindful eating, I have learnt to embrace my body and stop beating it up for what it's not. It doesn't feel like an effort to maintain - it's an approach that's with me for life.

**“MINDFUL EATING MEANS HAVING AN
END TO THE CHAOTIC FOOD THOUGHTS AND
CHOICES; IN ESSENCE, BEING PRESENT WITH
WHAT I HAVE CHOSEN TO EAT”**



HOW DID YOUR EXPERIENCE WITH MINDFUL EATING TURN INTO A BUSINESS IDEA?

For a good few years before discovering mindful eating, I found myself fed up with the repeated conversations I was having with friends about joining a slimming club – again! It was like we all felt resigned to carry on with the same old cycle of body loathing and restricted eating for weight loss. It was definitely a feeling of being trapped in a societal paradigm of expectation for everyone to be slim. All I can recall was losing my fear of being judged long enough to get going and open our first group.

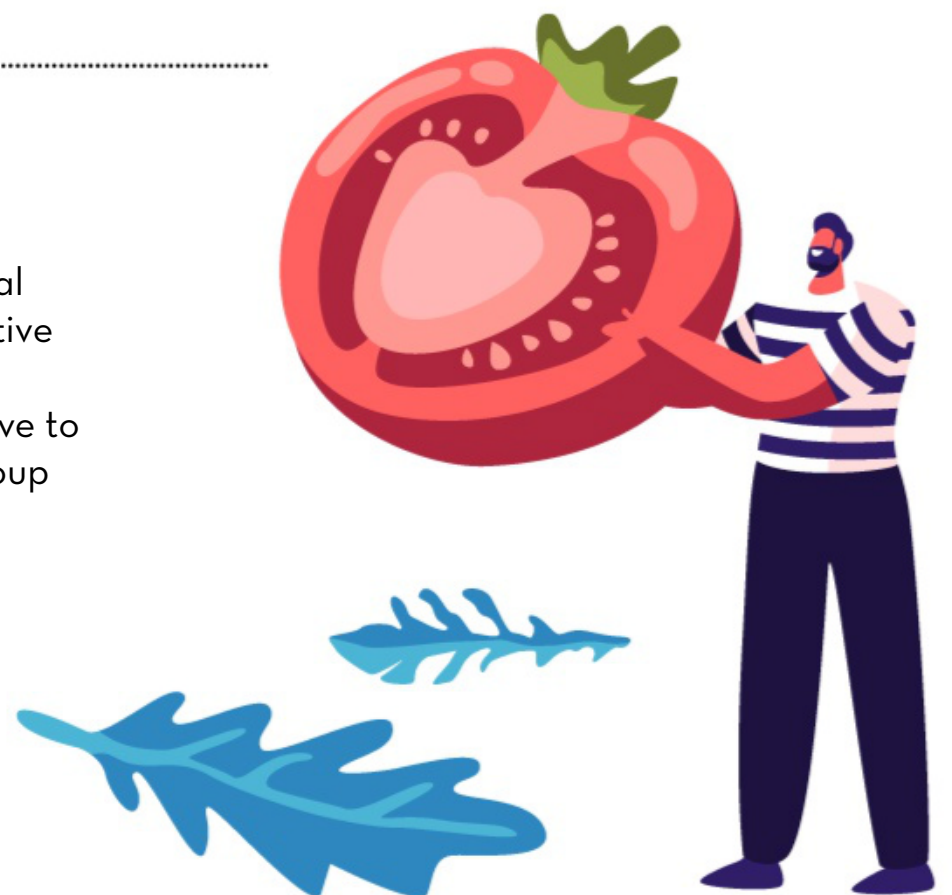
HOW WAS NUTRIRI BORN?

I didn't really have many answers back then; it just felt like it was the right time.

Enough was enough and no one else seemed to be coming along with other solutions to tackle things like eating disorders and obesity. In the UK, the cost to society from the impact of eating disorders is estimated at £15 billion per year (www.beateatingdisorders.org.uk) and we spend around £500 million each year to stand on scales at slimming clubs. I just knew that these two figures were connected, and I had a burning desire to help others make a lasting change from feeling less than good enough. We are a mission-led business; passionate to make this social change but astute enough to make it pay for itself. I didn't really know what a social enterprise was, but I asked Lloyds Bank, Big Lottery and the Dartington School for Social Entrepreneurs for help and they did! We received a small grant and mentoring to learn how to be in business. We are fundraising to train our first round of clubs to open around the UK, and already have future social franchise/licensees further afield. We are developing a work skills programme, to find and enable those with true 'lived experience' of the problems we are alleviating, to train and run groups of their own.

WHAT WERE THE LEARNINGS THAT YOU WANTED TO SHARE WITH PEOPLE?

The body positive movement is gathering pace, and social media is reclaiming space for ALL bodies. Aside from active positive role models, nutriri.org felt that an 'in real life' support network was needed, a compassionate alternative to slimming clubs; especially as our first members at the group were lower-weight individuals asking for help with body confidence and food chaos, both men and women.



WHAT DOES NUTRIRI DO?

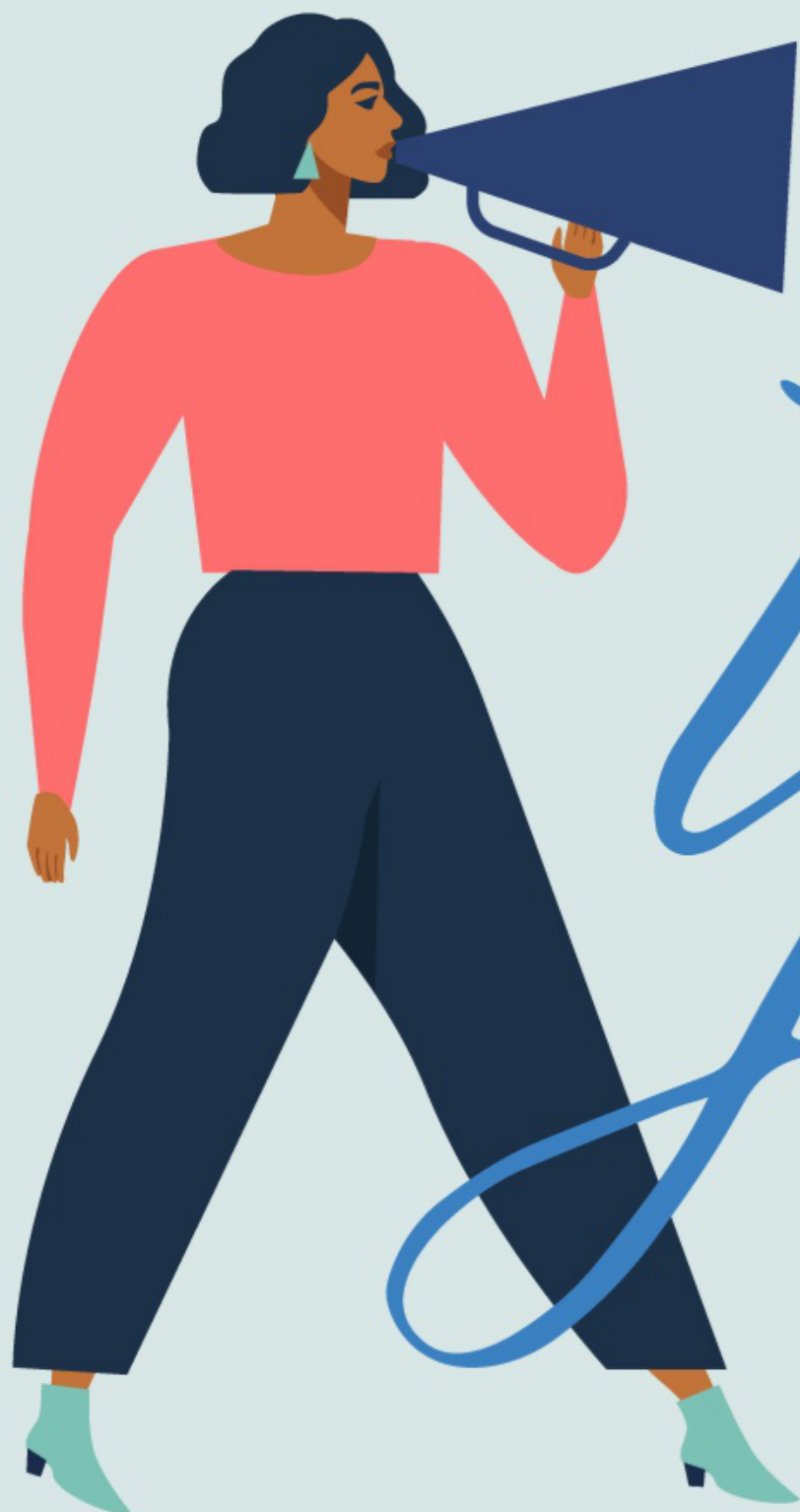
We create safe spaces that teach mindful eating and body confidence, but it's more than that. We coach and support an individual theory of change in people without judgement. So if you have the mindset 'I want to accept my body as it is but also wish to change weight', we will support that. If you've previously over exercised or over restricted your eating and want to find food/body ease, we will support that too. If you have had weight-loss surgery and are still searching for wellbeing around food and/or body, we will support that. We don't divide and conquer for profit; we work with ALL bodies and minds, recognising the value of sharing and supporting together. The weekly groups are designed to be welcoming and fun, non-shaming and nurturing (it's what Nutriri means).

WHAT'S NEXT FOR NUTRIRI?

In addition to training, funding and opening our first groups across the UK, we offer a free course via our website, **nutriri.org**. We're also creating an accreditation route for existing health, fitness and nutrition professionals who feel their practices are combined in a weight-loss focus and are interested in a new approach. We want **nutriri.org** to be so effective at helping people that we run out of 'customers' as soon as possible!



Get in touch with Helen at **helen@nutriri.org** if you'd like to find out more and be part of this huge social shift in diet culture and positive body acceptance. Or visit **www.nutriri.org** for more information and to access a free Body Confidence and Mindful Eating course.



SAY

Please

Agreeing to everything may keep others happy, but often at a personal cost. Here's why sometimes saying no means saying yes to self-worth

WORDS SARA NIVEN

Growing up, we are generally taught that saying no all the time is considered impolite. And while young children have no problem using the word freely, sometimes as adults we need reminding of our right to it.

It's one thing to want to help others, but people who feel as though they simply can't say no suffer from an uncontrollable need for approval, and they may have deep-seated fears of anger and confrontation. As the late, acclaimed psychologist Doctor Harriet Braiker points out in her *New York Times* bestseller, *The Disease to Please: Curing the People-Pleasing Syndrome*: "For many, the difficulty may start innocently enough with genuine and generous attempts to make others happy. But this seemingly harmless passion to always be 'nice', to put others first and to compulsively please them even at the expense of your own health and happiness rapidly spirals into a serious psychological

syndrome with far-reaching physical and emotional consequences."

It's obvious that continually adding to a heavy workload because you can't say no to anything risks causing physical exhaustion. But we are less likely to consider how emotionally unhealthy it is too. Always shelving our own needs and desires to meet someone else's effectively sends out the message that we don't deserve any - both to ourselves, as well as others, who may then take advantage. Of course, there are numerous situations where agreeing to things we don't want to do is inevitable or essential. Every parent and most employees will be used to this on a daily basis, and even people with healthy boundaries would find it impossible to say no in such circumstances.

If a teenage son or daughter calls to say they are stranded, safety concerns will override the fact that being woken at 3am to drive into town wasn't on our agenda. For somebody struggling financially, turning

down paid overtime may not feel like an option, however much they have on their plate. But if there's the expectation you'll drop your own plans (or lose sleep) to provide a regular unpaid taxi service, or to work late every time a report is dropped on your desk at 5pm, learning how to say no gracefully, assertively and firmly is an essential skill for you to master.

For those suffering from the 'please disease', this may take some groundwork and self-examination. First, you need to assess why you continually agree to things you don't want to do. Examine what saying no represents. Is it rejection from social circles? A fear of being disliked, or not doing your job properly? Or perhaps it's concern for being seen as a 'bad' parent or partner? Did you grow up seeing it as essential to toe the line to avoid difficult situations? Remind yourself that self-care is not the same as being selfish, and it isn't your job to take on everyone else's problems or practicalities. If low self-esteem is

TO THE POWER OF *No*!

the main issue, work on this with a qualified counsellor. Then follow our top tips for regaining the right to say no:

Start small. Like any habit, saying yes to everything can be hard to break.

Some people will feel easier to say no to than others, just as some things will – start with these and build up.

Give yourself time. If your default response is to immediately agree, say that you need to check arrangements. Just don't let this turn into procrastination and guilt.

Focus on the positives of a negative and your desired outcome. Saying no to something that isn't a fit for you means being able to say yes to something that is.

Be prepared for some people to be taken aback or try to persuade you, particularly if they are used to you agreeing to everything. Stay polite but firm.

Avoid rambling explanations. "That sounds lovely but I have plans on Friday," is enough. As American etiquette expert and author Judith Martin once acknowledged: "Part of the skill of saying no is to shut up afterwards and not babble on, offering material for an argument."

Give an alternative suggestion if there's a compromise that works for you, as long as you don't end up agreeing to something else that doesn't. It's pointless saying no to manning a stand at a fête, only to

get lumbered with making umpteen batches of cupcakes when you don't have time for either.

Finally, if you regularly struggle with how to answer a request or demand, heed this simple line of advice from Brazilian novelist Paulo Coelho: "If you must say yes, say it with an open heart. If you must say no, say it without fear." ■

“REMEMBER
THAT SELF-CARE
IS NOT THE
SAME AS BEING
SELFISH”

STOP WORRYING, START SOCIALISING

Are you more likely to get butterflies at a social event than be a social butterfly? Find out how to burst more confidently out of your cocoon



WORDS SARA NIVEN

Getting an invitation to a party, wedding or night out is something we are generally expected to be pleased about. Choosing what to wear, meeting new people, and the chance to be part of a special event or get together are all seen as positives.

Not everyone feels that way, however. Although a few nerves can be natural, people who experience physical stress-related symptoms, worry about events weeks in advance or avoid them altogether, could have social anxiety disorder, or social phobia as it is otherwise known.

This recognised mental health condition is considered one of the most common anxiety-related issues, and the third most prevalent psychiatric disorder after depression and alcohol dependence.* Defined by mental health professionals as 'persistent fear and anxiety when it comes to social interaction', sufferers feel exposed to possible judgement or evaluation, especially by strangers.

According to Professor Nick Neave at the Psychology Department of Northumbria University, this actually makes some basic biological sense. "As human beings, we evolved from small kin-based groups, where individuals were surrounded by relatives and everyone knew their place in the social hierarchy. In modern times we are faced with anonymous, large complex societies that may involve meeting strangers every day, particularly when it comes to social occasions. This causes anxiety because we constantly have to work out where we stand with them and never know if they mean us harm." In the past, anxiety might have helped us to stay aware of any potential danger, but it can cause daily distress for those struggling with it today.

So how can you deal with nerves ruining your enjoyment of occasions or preventing you from going altogether? It can be useful to consider any specific anxiety triggers. Most of us feel more comfortable in certain situations over others, and there's nothing wrong with

gravitating towards those we see as a fit, and turning down those we don't. Glastonbury may be out of the question if crowds and camping make you nervous, but perhaps you'd feel more at ease seeing a live band at a low-key event?

If it boils down to fears of being judged, it may be useful to explore any long-held beliefs or conditioning contributing to this.

"People who experience social anxiety often describe their parents as over protective and over critical, which can have a long-standing effect on their social interaction with others," explains a spokesperson for the national charity Anxiety UK. "Equally, some may have been bullied at school, which led them to develop a negative view of themselves and how they perceive others see them."

Whatever the cause, Anxiety UK has a national accredited talking therapy service where anyone struggling with social phobia can access counselling, clinical hypnotherapy or cognitive behaviour therapy (CBT). CBT is seen as a particularly helpful therapy for dealing with anxiety, with sessions often including practical steps or homework. Not everyone is keen on taking medication but it may be worth speaking to your GP to see if they feel it could be helpful in certain circumstances.

For big events you feel particularly fearful of, it can be useful to work through the situation in your head but instead of worrying about what may go wrong, picture it going well. Visualising yourself greeting people, smiling and even enjoying it can act as a dress rehearsal for the real deal.

Focusing on others can also be a valuable tool. Have a few suitable questions prepared that invite people to talk about themselves. Good listening skills and genuine interest will be appreciated and may help you feel less self-conscious and anxious.

If you find yourself completely overwhelmed in a social situation, the mental health charity Mind suggests a number of breathing exercises and relaxation techniques. Find out more on its website: www.mind.org.uk.

HOLD THAT THOUGHT

Challenge your thinking if you recognise the following:

AWFULISING

This is always imagining the most 'awful' outcome. It's one thing to be prepared for not knowing many people, and another to decide that if no one immediately approaches you, you're a total social failure.

PERSONALISING

This refers to thinking you are the focus of everyone's attention in a negative way. For example, if a group of people are laughing, you immediately decide they must be poking fun at you, when it is far more likely they are just having fun.

ALL OR NOTHING

There's a middle ground between feeling pressure to be the life and soul and not attending at all. You could decide to go and see how you feel after an hour and make a polite excuse if you're struggling. Over time, you may start to feel more at ease in similar situations.

For further details about the treatment of social anxiety see [NICE Clinical Guideline CG159](http://www.nice.org.uk/guidance/cg159) www.nice.org.uk/guidance/cg159

For information on the support services provided by Anxiety UK call [03444 775 774](tel:03444775774) or visit: anxietyuk.org.uk

5

STRANGE FACTS ABOUT memory

Memory can be a playful thing. It collects minute details from childhood events, yet leaves us wondering where we left our keys

WORDS BAHAR GHOLIPOUR

1

DOORWAYS DESTROY MEMORY

Do you ever find yourself in a room, without remembering why you ended up there? Researchers say the doorway may be to blame. The very act of walking through a door may hint to the brain that a new scene has started and it should store prior memories away, causing strange memory lapses. "Entering or exiting through a doorway serves as an 'event boundary' in the mind, separating episodes of activity and filing them away," explains Gabriel Radvansky, a psychologist at the University of Notre Dame. "Recalling the decision or activity that was made in a different room is difficult because it has been compartmentalized." Event-boundaries are useful, because they help us to organise our mental timelines and remember not just where, but when events occurred.



2 MIND-ERASING ACTIVITIES

Although rare, certain activities can result in a temporary memory loss and brain fog, called transient global amnesia. For example, sex has been reported to cause this memory problem, with patients forgetting the past day or so, and having difficulty forming new memories.

People with transient global amnesia suffer no serious side effects, and the memory problems usually disappear in a few hours. But it's not clear how this happens, and brain scans of patients who have had this type of amnesia show no signs of damage to the brain, or signs of stroke.



“IT’S POSSIBLE TO LOSE MEMORIES BEFORE THEY EVEN HAVE A CHANCE TO BECOME STORED, DUE TO INJURIES IN THE BRAIN’S STRUCTURES”

4 WE MAY BE PROGRAMMED TO FORGET INFANCY

Our earliest childhood memories fade, and there's likely a reason for that. Usually people don't recall any memories from their earliest years of life before the age of three or four. This is called infantile amnesia. Scientists previously thought that early memories were there, but children just didn't have the language skills to verbalise them. However, recent research shows that children do make memories during their early years, but forget through deliberate mechanisms. One explanation for this is that the developing brain, while generating cells, wipes out stored memories.

5 BRAIN INJURIES MAY CAUSE FORGETFULNESS

It's possible to lose memories before they even have a chance to become stored, due to injuries in the brain's structures that are specifically involved in handling memory formation, maintenance and recall. Damage to these areas can result in curious forms of amnesia. In one of the most-studied cases, Patient HM lost the ability to form any new memories after his hippocampus was removed during a surgery to treat his epilepsy. Another famous case records the story of Patient EP, who had a similar fate after he had inflammation of the brain caused by a virus.

3 MEMORIES CAN LIVE ON, EVEN IF WE CAN'T ACCESS THEM

Could forgotten songs continue to live on inside our heads, without us knowing? In a 2013 report of a strange case in the journal *Frontiers in Neurology*, researchers described a woman who had musical hallucinations of a song that she didn't recognise, but others did. "To our knowledge, this is the first report of musical hallucinations of non-recognizable songs that were recognized by others in the patient's environment," the researchers wrote. The scientists said the woman had likely known the song at some point, but forgot it. The case raises the question of what happens to forgotten memories, they said, and suggests that memories can be stored in some form in the brain that renders them accessible, and yet unrecognisable.



THE CRUELLEST DISEASE

The various forms of dementia now affect 50 million people around the world. There are 10 million new sufferers every year – and still no cure

WORDS EDOARDO ALBERT



Although there is not much good to be found in dementia, its increasing prevalence is a consequence of something that is undeniably good: we are all living longer. For while there are a number of risk factors associated with dementia, by far the most important is age. Since people are living longer, it stands to reason that more of us run the risk of developing dementia.

In 1850, the average life expectancy for a European was 36.3 years, while in 2014 it was 86.7 years. There is only a one in a thousand risk of anyone under 60 developing dementia - before the astonishing increase in life expectancy that we have seen over the last 150 years, there would have been few cases of dementia as few people lived long enough to develop it. But now, with an increasing proportion of the population living into their 90s and beyond, the number of people at risk from dementia has increased. For people between 60 and 64, one in a hundred will probably develop dementia. For those between 75 and 79, that increases to six in one hundred. Between 90 and 94, the risk increases to 30%, and for those who live to 95 and older the risk is 41%. Dementia is fundamentally a disease of aging.

What is dementia?

There is a range of conditions that fall under the general label of dementia. The most common is Alzheimer's, which affects

between 50 and 70% of dementia sufferers. The various dementias impact the brain's ability to think and recall, having a dramatic effect on a person's ability to perform everyday tasks. In its most advanced forms, dementias leave the sufferer unable to survive without constant care.

After Alzheimer's, the next most common form of dementia is vascular dementia. This condition can arise after suffering a stroke, and accounts for about a quarter of dementia cases. Other relatively common forms include dementia with Lewy bodies and frontotemporal dementia.

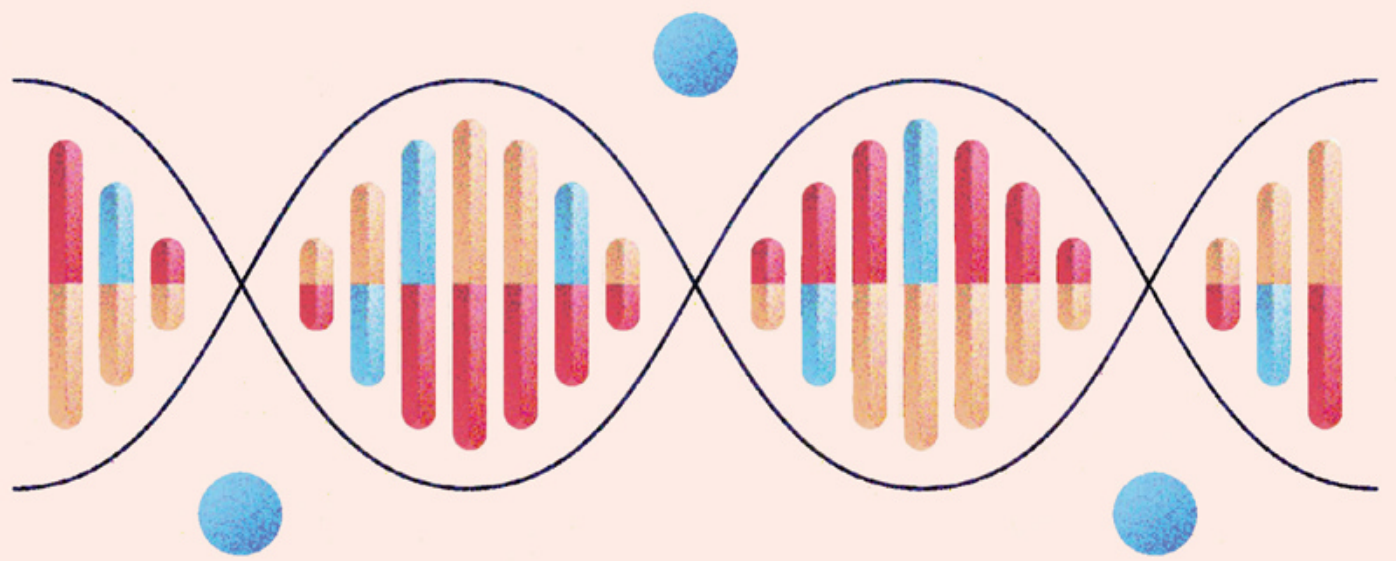
A rarer type of dementia can be caused by normal-pressure hydrocephalus, which results from excess cerebrospinal fluid. This condition presents a triad of symptoms causing gait abnormalities, incontinence and dementia (often called, in a diagnostic mnemonic, 'wet, wacky and wobbly'). Several other disorders (including Parkinson's and Creutzfeldt-Jakob disease) and even some infections can also cause dementia.

“A RANGE OF CONDITIONS FALL UNDER THE GENERAL LABEL OF DEMENTIA”

All of these conditions cause the deterioration in brain function and memory that are collectively known as dementia. One of the difficulties that has bedevilled the search for treatments is the lack of a satisfactory diagnostic test for the various different forms of dementia - particularly for Alzheimer's. Diagnosis is based on a medical examination, tests and a case history, and requires significant impairment in at least two of the five key mental faculties: memory; language and communication; concentration and attention; judgement and reasoning; and visual perception. However, since the symptoms of the different forms of dementia overlap considerably, it is often difficult for doctors to diagnose the specific form of dementia from which the patient is suffering.

Risk factors for dementia

Above everything else, the chief risk factor for developing dementia is age. This is particularly true for the most common form of dementia, Alzheimer's. However, after the complex effects of ageing, other factors come into play. One of these is having a family history of the disease, which increases



the risk of inheriting genes that predispose people to developing Alzheimer's.

There is also a strong association with Down's syndrome. Both Down's syndrome and Alzheimer's are associated with abnormalities on chromosome 21. People suffering from Down's syndrome have a higher-than-average risk of developing Alzheimer's as they age, with close to half of Down's syndrome sufferers developing Alzheimer's in their 60s (whereas it's less than 10% in the wider population).

Apart from Down's syndrome, other cognitive impairments also increase the risk of dementia. While these factors are beyond personal control, others can be guarded against. For instance, having a history of head injuries significantly increases the risk of dementia. Medical advice regarding the effects of concussion is changing - the old days of playing rugby and being sent back on the field as long as you could stand up are thankfully past. But low-intensity brain injuries can have a cumulative effect, resulting in dementia. Sports that could potentially involve head injuries should be performed with helmets where possible and, crucially, sufficient time must be given for people to recover from any concussion.

The classic signs of unhealthy living - smoking, obesity and drinking to name a few - are also implicated in the development of dementia. Unsurprisingly, the medical advice is to stop smoking, keep fit and drink in moderation. Not only will this reduce the risk of dementia, but it will significantly improve your overall health as well.

On the health front, it's not just the unholy trinity of smoking, drinking and obesity that can lead to dementia - our mental health can play a role too. Studies have indicated that people over 55 who suffer from steadily increasing levels of depression are at greater risk of developing dementia than those with low or variable levels. Wider studies have also shown that social isolation, which often increases as people get older, is linked to a greater vulnerability to dementia. In fact, the

lonelier and more isolated someone becomes as they get older, the greater their risk of developing dementia.

Is there anything we can do to avoid getting dementia?

The good news is that the things we can do to reduce our risk of developing dementia are generally beneficial to our overall health and wellbeing. Ever wanted to learn a new language or how to play the guitar? Do it. It doesn't matter how old you are, activities that require intense concentration (preferably paired with new muscle memories) are ideal. Learn to tango. Become a potter. Make ships out of matchsticks. Sing, or better yet, join a choir. That way the learning will be combined with fresh and exciting social relationships. Human beings are social animals and, as a general rule, we need company to function properly. Solitary confinement is used as a punishment - don't let it become a lifestyle. Aside from these activities, the medical conditions that can lead to strokes, and hence vascular dementia, should also be guarded against. High among these risk factors is diabetes, so exercise and a healthy diet (which help reduce the chances of developing type 2 diabetes) can therefore reduce the risk of getting dementia.

The genetics of Alzheimer's

Within the many variations of dementia, most research has been focused on investigating the genetics of Alzheimer's. The strongest evidence for a genetic cause has been found for a variant called early-onset Alzheimer's disease. As the name suggests, this devastating form of the main syndrome manifests far earlier than the more common late-onset form, affecting people in their 30s to mid-60s. This variant affects less than 10% of all those who get Alzheimer's.

Of those who suffer from early-onset Alzheimer's there is a small subset, affecting about 500 families around the world, where the disease is caused by mutations in chromosomes 1, 14 and 21. So within a very »

small section of the population of people with Alzheimer's - probably less than 1% - a direct genetic cause for the disease has been found.

Scientists have not yet found a direct trigger gene for the more common late-onset form of Alzheimer's. However, a gene on chromosome 19, apolipoprotein E (APOE), has been found to play a role in the disease. Of the different alleles (variants) of the gene, the most common - APOE 3 - is neutral with respect to Alzheimer's. On the other hand, the allele APOE 2 may actually protect against Alzheimer's, while APOE 4 is a risk factor for developing the disease.

However, with Alzheimer's nothing is ever so straightforward. While carrying the APOE 4 allele on chromosome 19 increases the risk of developing Alzheimer's, and at a younger age, it is not a necessary and sufficient condition. Some people with the risk allele never develop the disease, and others who do get Alzheimer's do not have the APOE 4 allele.

Researchers have widened the search for genes that might cause Alzheimer's using genome-wide association studies, which look for links between specific genes (or gene variants) and certain traits. These projects have revealed more regions in the genome (the complete DNA of an organism) that appear to be associated with the disease. Further research is needed to find out what roles these regions play in the development of Alzheimer's.

What does Alzheimer's do to the brain?

Nothing good. The disease was first identified by Alois Alzheimer, a German psychiatrist, in 1901. A woman named Auguste Deter, a patient at an asylum in Frankfurt, came to the attention of Alzheimer. During the next five years, until she died in 1906, he became fascinated by her case. Asked questions, Deter would reply, "Ich habe mich verloren" ("I have lost myself").

When Deter died, Alzheimer examined her brain. He found it contained clumps of protein, called plaques. We now know that these plaques are made up of beta-amyloid protein, and are a key feature of the disease. As Alzheimer's progresses, it destroys brain cells, called neurons, and disrupts the neurons' connections with each other, a vital aspect of mental function. Usually, the disease first attacks the neurons in areas of the brain involved with memory, before spreading to the cerebral cortex and those areas responsible for reasoning, language and behaviour. In someone with late-stage Alzheimer's, the brain will be atrophied, with the specific regions affected by Alzheimer's reducing in volume.

Such major physical changes in the brains of patients with Alzheimer's are associated with many microscopic and biochemical

FROM THE FRONT LINE OF DEMENTIA RESEARCH



We spoke to Dr Giovanna Lalli, the UK Dementia Research Institute director of scientific affairs, to ask her about the future direction of dementia research.

"It's very important not to think in silos; at the UK

Dementia Research Institute we're investigating different types of dementia, which are characterised

by inflammatory states, by misfolding or the aggregation of toxic proteins. We're tackling dementia from different angles and perspectives - from genetics to the interactions between brain cells, vasculature and the immune system, to the identification of novel biomarkers. We want to be innovative and drive a step change in how we understand these diseases; to accelerate the discovery and delivery of interventions to diagnose but also treat and ultimately prevent dementia. This is our ultimate goal - that's why we exist.

We're gaining momentum, and the fact we're able to attract young talent from across the world is exciting - we need fresh thinking, fresh perspectives to tackle this problem.

"I'm optimistic we're going to have breakthroughs in our knowledge over the coming years, because we have new methods of studying how different types of cells in the brain interact and how different genes are signalling to each other. By using the latest technologies - such as high-resolution microscopy and single-cell sequencing, cutting-edge neuroimaging, and probes able to record activity in hundreds of different neurons simultaneously - harnessing the power of all these techniques together with insights coming from genetic studies can help us better understand not only how the brain works, but also how dementia develops. Then it will be a case of translating these findings into treatments."

changes in their brains too. The beta-amyloid plaques that Alzheimer first identified form clumps in between neurons, disrupting their function. Research also suggests that the beta-amyloid plaques interact with another feature of Alzheimer's: tangles of tau proteins. These tangles form within the neurons and prevent nutrients being transported to the extremities of the cells properly, and they stop neurons communicating properly. It seems that abnormal tau proteins gather in memory-related parts of the brain, while beta-amyloid plaques form between the neurons in these regions. When the amount of beta-amyloid plaques reaches a critical level, a cascade of abnormal tau proteins spreads through the rest of the brain, causing neuronal collapse.

Other research has pointed to chronic inflammation in the brain being another cause of Alzheimer's. The cells that normally clean away accumulated junk chemicals in the brain (the microglia and astrocytes) fail to do their job and - as a double whammy - produce a chemical that causes chronic inflammation and further neuronal damage.

What are the prospects for effective treatments or a cure?

In the short term, poor. We still lack an adequate understanding of what causes most forms of dementia. The causes of Alzheimer's are proving particularly opaque. It was hoped that drugs designed to remove the build-up of beta-amyloid plaques would treat or even cure the disease, but these initial hopes have

been dashed. Multiple drug tests aimed at treating the beta-amyloid plaques have failed, but a number of alternative theories regarding the cause of Alzheimer's have been advanced recently, including environmental toxins, inflammation, and bacterial, viral and fungal infections.

A possible implication of this multiplication of proposed causes is that Alzheimer's might not be a single disease, or that it is a single disease but with many different causes. If Alzheimer's is actually a number of different conditions that exhibit similar symptoms, then researchers will have to find a way to distinguish the different forms of the disease before they are able to develop specific treatments for each type. It is a complex and time-consuming task, but if Alzheimer's should prove to be a single disease with multiple causes - even if those causes are harder to identify - a treatment might be easier to find.

The importance of care

With a cure for Alzheimer's and other forms of dementia still a long way off, the importance of how we care for those living with these conditions grows more apparent. In many cases, the carer is the spouse of the patient, a final service paid in honour and love. But it is not easy.

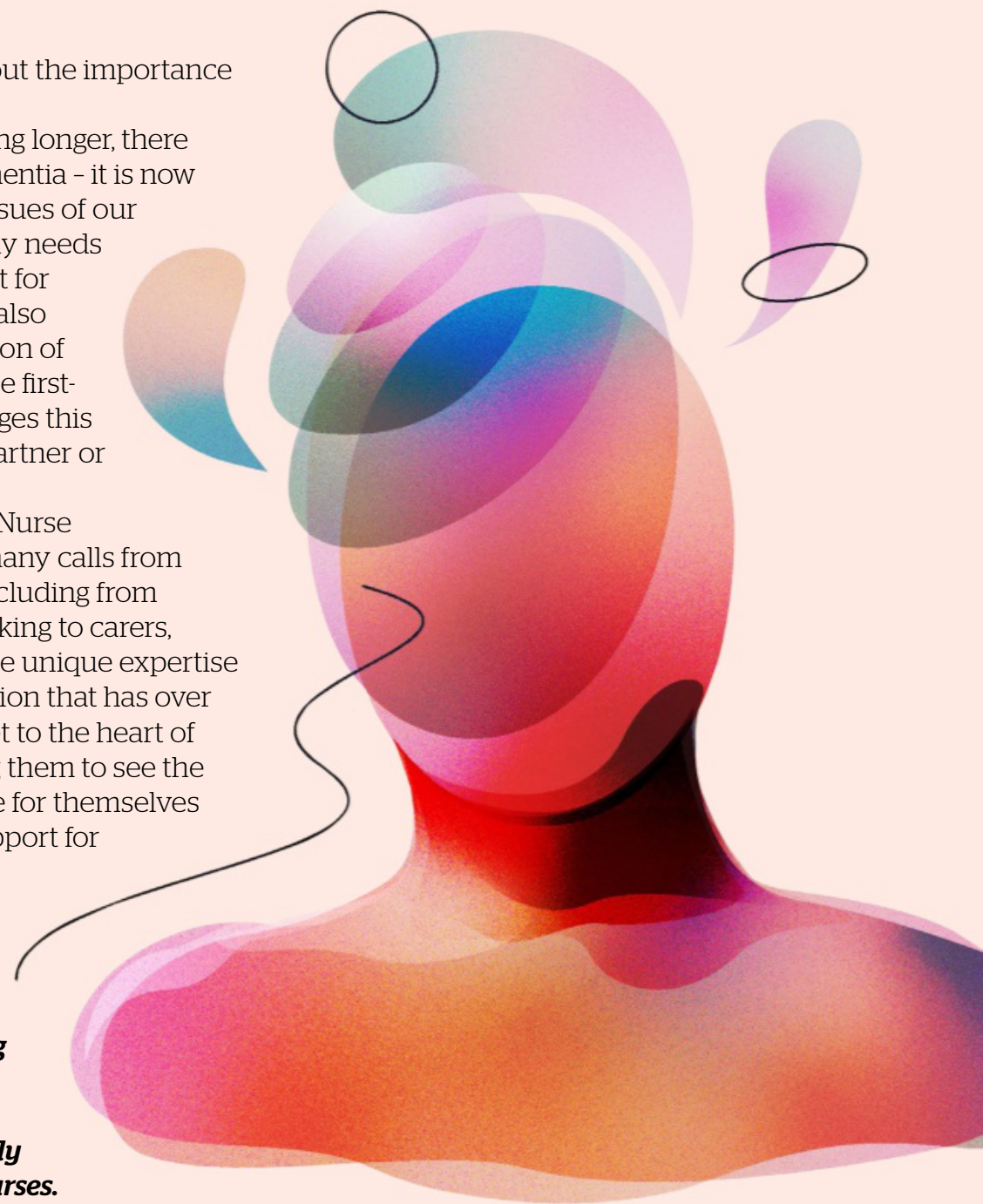
We spoke to Dementia UK's Pat Brown, who works on their Admiral Nurse Dementia

Helpline, to learn more about the importance of caregiving and carers.

"With the population living longer, there are more diagnoses of dementia - it is now one of the biggest health issues of our time. As such, there urgently needs to be more support, not just for the person diagnosed, but also for the often-silent generation of caregivers. They experience first-hand the devastating changes this condition can bring for a partner or family member.

"Dementia UK's Admiral Nurse Dementia Helpline takes many calls from people facing dementia, including from carers in distress. When talking to carers, Admiral Nurses can provide unique expertise and experience to a condition that has over 200 subtypes. They can get to the heart of carer's challenges, allowing them to see the importance of making time for themselves and accessing the right support for their circumstances." ■

If you are a carer, or know a carer who is struggling, or require any help and support with dementia, ring the Dementia UK helpline on 0800 888 6678. The helpline is staffed exclusively by experienced Admiral Nurses.



A POSSIBLE TREATMENT FOR ALZHEIMER'S?



Amid the general gloom over treatments for Alzheimer's, one new approach has improved the symptoms of some patients. Dr Dale Bredesen - working on the belief that Alzheimer's is not a single disease but has at least three different varieties - claims to have identified 36 different factors that contribute to the various forms of Alzheimer's. For a treatment to work, Dr Bredesen and his associates argue that the patient has to be assessed thoroughly to see which combination of these factors are implicated in causing their Alzheimer's, then the causative factors have to be removed or ameliorated. According to Dr Bredesen, there are three groups of causative factors: inflammation, which may be caused by a combination of infections, diet and other causes; toxins, including moulds and chemicals; and a decrease in the level of hormones and nutrients in the body.

Once the combination of factors affecting the patient has been identified, a detailed programme of exercise, diet, hormones and supplements is prescribed. While the programme has produced an improvement in some of the patients, it requires ongoing commitment for the beneficial effects to continue. Those who have stopped the programme have reported a return of Alzheimer's symptoms, so it can't be considered a cure for the disease. However, it is one of the very few treatments that has produced any improvement in symptoms. Further research and proper clinical trials are required to evaluate the treatment's full potential for future use in the battle against this most devastating of diseases.

WHY CAN'T WE REMEMBER OUR dreams?

You spend a third of your life asleep, a good chunk of which involves dreaming. But most often, you don't remember any of your dreams

WORDS BAHAR GHOLIPOUR

Even on those lucky days when you wake up with a memory of the dream still floating in your mind, there's a good chance that in just a minute the memory will vanish into thin air and back to dreamland. In waking life, such a case of quickly forgetting recent experiences would surely land you in a doctor's office. With dreams, however, forgetting is normal. Why?

"We have a tendency to immediately forget dreams, and it's likely that people who rarely report dreams are just forgetting them more easily," said Thomas Andrillon, a neuroscientist at Monash University in Melbourne, Australia. It might be difficult to believe that you had a dream if you don't remember anything, but studies consistently show that even people who haven't recalled a single dream in decades or even their entire lifetime, do, in fact, recall them if they are awakened at the right moment, Andrillon said.

While the exact reason is not fully known, scientists have gained some insight into

memory processes during sleep, leading to several ideas that may explain our peculiar forgetfulness.

You are awake, but is your hippocampus?

When we fall asleep, not all the brain's regions go offline at the same time, according to a 2011 study in the journal *Neuron*. Researchers have found one of the last regions to go to sleep is the hippocampus, a curved structure that sits inside each brain hemisphere and is critical for moving information from short-term memory into long-term memory.

If the hippocampus is the last to go to sleep, it could very well be the last to wake up, Andrillon said. "So, you could have this window where you wake up with



“DREAMS MAY BE JUST LIKE THOUGHTS AND DEEMED BY THE BRAIN TO BE TOO USELESS TO REMEMBER”

a dream in your short-term memory, but since the hippocampus is not fully awake yet, your brain is not able to keep that memory,” Andrillon explained.

While this might explain why dream memories are so fleeting, it doesn't mean that your hippocampus has been inactive throughout the night. In fact, this region is quite active during sleep, and appears to be storing and caring for existing memories to consolidate them, instead of listening for incoming new experiences. Upon awakening, the brain may need at least two minutes to jump-start its memory-encoding abilities. In a 2017 study published in the journal *Frontiers in Human Neuroscience*, researchers in France monitored sleep patterns in 18 people who reported remembering their dreams almost every day, and 18 others who rarely remembered their dreams. The team found that compared with low-dream recallers, high recallers woke up more frequently during the night. These middle-of-the-night awakenings lasted an average of two minutes for high recallers, whereas low-recallers' awakenings lasted for an average of one minute.

Neurochemical soup

Our poor ability to encode new memories during sleep is also linked to changes in the levels of two neurotransmitters, acetylcholine and noradrenaline, which are especially important for retaining memories. When we fall asleep, acetylcholine and noradrenaline drop dramatically.

Then, something strange happens as we enter the rapid eye movement (REM) stage of sleep, where the most vivid dreams occur. In this stage, acetylcholine returns to wakefulness levels, but levels of noradrenaline stay low.

Scientists have yet to work out this puzzle, but some suggest that this particular combination of neurotransmitters might be the reason we forget our dreams. The

boost in acetylcholine puts the cortex in an aroused state similar to wakefulness, while low noradrenaline reduces our ability to recall our mental escapades during this time, according to a 2017 study in the journal *Behavioral and Brain Sciences*.

Sometimes your dreams are just not memorable

Do you remember what you were thinking about this morning when brushing your teeth? Our minds wander all the time, but we discard most of those thoughts as nonessential information. Dreams, especially mundane ones, may be just like daydreaming thoughts and deemed by the brain to be too useless to remember, the late dream researcher Ernest Hartmann, who was a professor of psychiatry at Tufts University School of Medicine, wrote in *Scientific American*.

But dreams that are more vivid, emotional and coherent seem to be better remembered – perhaps because they trigger more awakening, and their organised

narrative makes them easier to store, Andrillon said.

If you are intent on improving your dream recall, there are a few tricks you can try. Robert Stickgold, an associate professor of psychiatry at Harvard Medical School, suggests drinking water before bed, as it will make you wake up to use the bathroom. These “middle-of-the-night awakenings are frequently accompanied by dream recall,” Stickgold told *The New York Times*.

When you go to bed, repeatedly reminding yourself that you want to remember your dreams may increase your chances, and so does keeping a dream journal, some studies have suggested. Upon waking up, hang on to that fragile dream memory: keep your eyes closed, stay still and replay the dream memory over and over again, until your hippocampus has the chance to catch up and properly store the memory. ■



Mindful DREAMING

Everyone dreams, but did you know you can use your dreams to achieve true happiness?

WORDS ZARA GASPAR

Have you ever dreamt that your teeth are falling out, or that you're being chased? Are you worrying about the way you look or how others perceive you? Are you running away from problems in your life that are causing you anxiety? Have you ever woken up after a strange or scary dream wondering what it meant? There are a lot of common dreams that people have, including falling, being naked or flying. You can use dream dictionaries and symbols to try and interpret what those dreams really signify, but only you really know what your dreams mean and only you can harness this power to change your life.

The average human spends six years of their life dreaming. That's about one or two hours - between four and seven dreams - each night. Scientists haven't yet figured out what dreams really are or why we dream, but we do know that how we dream can affect our emotional and mental wellbeing. Have you ever woken up after a bad dream only to start the day off in a bad mood? When we're having problems we tend to push down and bury our feelings, but dreams unlock our unconscious and we can't hide from them.

Instead of just dreaming and wondering what those dream mean, you can use them as a way of solving the issues in your life. Take time to understand your dreams and you can find out more about the deepest parts of your self. If you're seeking peace and fulfilment, your dreams can help you.

WHAT ARE DREAMS?

While we may not know the purpose of our dreams, we can still benefit from exploring what they are

Although a great deal of scientific studies have investigated dreams, we still don't have a definitive answer to what they are. We can define dreams as a collection of images, thoughts, feelings, sounds, sensations and memories or stories that the brain tells us when we are asleep. Dreams occur involuntarily during the REM (rapid eye movement) stage of sleep. This is the deepest stage of sleep which can last between a few minutes and half an hour, making up 20-25% of sleep. We know we can dream about real life or fantastical scenarios; people and places we know, or weird and wonderful imaginings; mundane memories from the day, or our deepest fears and fantasies. Our dreams can be positive or negative experiences, but we still don't have a full understanding of what is happening in our brains when we dream, or what their purpose is.

Neurologist Sigmund Freud believed that dreams were a window to the unconscious.

Some people believe dreams are just electrical brain impulses, or the brain's attempt to process the information from the day. Others think that they are memories being consolidated or prophecies guiding our future actions. While we continue to pursue the answer, all of these theories can be used to help you use your dreams to your advantage.

Does everyone dream?

You may think you don't dream, but chances are that you do, you just don't always remember them. Even other animals dream – after all, dreaming is an activity in the brain, and we all have brains. The only people who may not dream are those with certain psychological disorders.



THE SCIENCE OF DREAMING

We may not be able to define what dreams are, but what's going on in our brains when we dream?

Oneirology is the study of how the brain works during dreaming. We tend to dream the most when our brain activity is at its highest, which is why we feel like we're awake when we're not.

During the day, your memories are stored in the hippocampus, and when you sleep, these are transferred to the outer part of your brain. Because your eyes are closed, you're not seeing anything through your primary visual cortex. Your secondary visual cortex is therefore interpreting the images in your head instead of what you see. Your limbic system, which controls your emotions, is particularly active when you dream, which is why your feelings during dreams are so heightened. The brain's dorsolateral prefrontal cortex, which controls your logic, is not active, which is why we often experience far-fetched dreams. Although we can see what the brain is doing when we dream, we still don't fully understand why.

5 Strange DREAM FACTS

Here are five bizarre things you never knew about dreaming

YOU FORGET 90% OF YOUR DREAMS

Most people forget half of what they've dreamt about within the first five minutes after waking, and 90% after ten minutes. Some 60% of people don't remember their dreams at all.

BLIND PEOPLE DREAM TOO

Even blind people dream. People who become blind after birth dream as usual using the images their brains have stored in the past. Those born blind simply experience sensations, instead of seeing images.

WE ONLY SEE FACES WE KNOW

You may wake up thinking you've had a dream about a complete stranger, but our brains can only dream up images we've already seen, or some combination of them. Although you may not remember, you've seen the face (or a version of it) before.

WE DON'T ALL DREAM IN COLOUR

Not everyone dreams in colour – about 12% of people dream in black and white. However, according to one study this number has gone down since black and white television changed to colour.

MEN AND WOMEN DREAM DIFFERENTLY

About 70% of men dream about other men, whereas women dream about both sexes equally. Men's dreams also tend to be more aggressive than women's dreams, whereas women have more nightmares.

WHY DO WE DREAM?

What's the purpose of these flights of fancy or night terrors?

The reason for our dreaming remains a mystery. Just like the meaning of what dreams are, there's no single answer to the purpose of these night-time visions, but there are many theories. Some scientists believe that there is no other reason for our dreams than the brain simply responding to impulses or storing memories. Others believe dreams are a form of self-therapy or protection - the mind's way of working through difficult experiences or training itself to deal with threats. Some believe dreams are just an extension of waking consciousness, while others think they are premonitions. They could even be a creative outlet - after all, many people have said they have been inspired by their dreams, including the inventor of Google!

But whether the reason is biological, cognitive, or psychological, do we really need a definitive reason for dreaming? If it helps you through difficult experiences, if it helps you process things, or inspires your creativity, the important thing is to understand how you can use your dreams to improve your life. Once you understand your dreams and what they mean to you, you can achieve what you really want.

Snacks can cause nightmares

If you eat too late in the evening, your metabolism increases. This causes more activity in the brain, which can lead to nightmares. Nightmares can also be caused by scary books or movies, so make sure you eat early and try to have a calming, positive bedtime routine.

FACE YOUR FEARS

The most common feelings in our dreams are anger, sadness and fear. Nightmares are simply disturbing or terrifying dreams. These can often be caused by an underlying depression or anxiety in a person's mind. Common nightmares include falling or someone you love dying, which can mean that you're nervous about something in your life or beginning a new chapter. What's your most terrifying nightmare? Write it down, think about what it means and how you can change how you're feeling.

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WEIRD & WONDERFUL DREAMS

What's the most bizarre dream you've ever had? Were you flying in space? High flying can represent euphoria or confidence. You may not think weird dreams are important to record, but it's good to write down your highs and lows. Sometimes negative dreams can have positive meanings and vice versa. Write down your weirdest dream and reflect on what your subconscious could be telling you.

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LUCID DREAMING

Learn how to control your dreams and you can help steer your destiny

Have you ever realised you're dreaming in the middle of a dream? Usually a dream feels real and you only realise it's not once you wake up, but a dream where the person is aware that they are dreaming is called a lucid dream.

Some people have trained themselves to have lucid dreams so that they are able to control elements of their dreams, a bit like being in a movie where the lead can change parts of the plot. If you can learn how to lucid dream, every vision and sensation will feel so much more real. You'll be able to enjoy every moment of fulfilling your fantasies by kissing your favourite rock star or making yourself able to fly, for example.

Lucid dreaming therapy can also help you tackle your fears. Afraid of heights? You can scale a mountain in your dream with no fear for your safety. You can even use lucid dreaming to tap in to your creative side; paint a masterpiece or compose a symphony. It's your dream; you can do whatever you want to do and be whoever you want to be. By achieving this in your dreams you'll also learn how to believe in yourself more when you're awake. Lucid dreaming is rare but it is possible. The more mindful you are, the more likely you are to achieve it.

You can't read while you're dreaming

Want a quick and easy way to tell if you're dreaming or not? You can't read or tell the time when you're dreaming. If you become aware that you may be dreaming, try to see if you can read something or check the time to determine whether or not what you're experiencing is real.

“LUCID DREAMING THERAPY CAN HELP TACKLE YOUR FEARS”

TRAIN YOURSELF TO LUCID DREAM

If you want to learn how to lucid dream, here are a few tips to help

REALITY TESTING

Try to perform a reality check a few times (around ten times) during the day to remind yourself to do this when you're dreaming too. For example, look at your feet to ensure they're grounded. If they're floating off the ground, you'll know you're dreaming.

MEDITATE

Meditation can help with lucid dreaming. Try meditating once during the day and then again half an hour before going to bed. A healthy mind and body will help you achieve lucid dreams. Meditation helps to clear your mind and make you more self-aware. The more you practise, the better it will work.

WAKE BACK TO BED

The wake back to bed technique is a way of adapting your REM cycles to help you have lucid dreams. Get six hours of sleep and then wake yourself up, get out of bed for 20 to 60 minutes and then go back to bed.

MNEMONIC INDUCTION

Mnemonic induction is a process of repeating an action until you fall asleep, such as counting sheep before bed. Try repeating the words “I will dream tonight and I will be aware that I will be dreaming” to train your brain to lucid dream.

KEEP A DREAM JOURNAL

Writing a dream journal is a good way of training yourself to lucid dream as the more you remember your dreams, the more aware you'll become. Write down your dreams and then reflect on them. Researching lucid dreaming will also help you. The more dedicated you are, the more success you'll have.

THE IMPORTANCE OF DREAM ANALYSIS

Learn to understand your dreams and you will learn more about yourself

Sigmund Freud believed that dreaming was the “royal road to the unconscious,” and he developed dream analysis as a way of unlocking the unconscious mind. We may not truly understand what dreams are or why we dream, but analysing your dreams can be invaluable when it comes to discovering more about yourself. It’s a controversial idea, as many scientists don’t believe dreams have meaning. But many believe that by accessing your unconscious and giving meaning to your dreams, you can discover things you never knew about yourself, unravel your deepest desires and heal whatever troubles you the most.

You don’t need a dream dictionary to do this. While you may be able to read up on specific dream symbols and their meanings, it’s more important to reflect on your dreams and what they mean to you. Research has shown that dream analysis can be an important part of mental health therapy, but you need to be careful. If you dream you’re going to fail an exam, don’t assume this means you’re going to fail in reality. You can’t let your dreams drive your actions. Instead, reflect on the meaning of this and how you can use it for a positive result. Yes, you may be stressed about your exam, but your dream may just be highlighting this stress to encourage you to calm down and consider how you can reduce this stress.

Seeing the future

According to a recent survey, up to 38% of people have precognitive dreams, meaning they see something that hasn’t yet happened but will happen in the future. When interpreting dreams, it’s important not to think that if something happens in a dream, it will become a future reality. ■

“REFLECT ON YOUR DREAMS AND WHAT THEY MEAN TO YOU”



ANALYSING YOUR OWN DREAMS

The more you analyse your dreams, the more you’ll start to understand about yourself, your mind and how to achieve wellbeing. Recording your dreams is important because you want to remember as much detail as possible and be able to re-read what you’ve written to reflect on this. Write it down as soon as possible, try to identify how you were feeling or what the dream could mean, and don’t forget to consider all the elements – the meaning is not always immediately obvious.

DREAM REFLECTION

Thinking about the meaning of our dreams goes hand in hand with being mindful

Life can be complicated, but if you want to slow things down, take the time to better understand yourself and improve your wellbeing, reflecting on your dreams can help you do this. Like everything in life, it takes practice. Mindfulness is like a form of therapy. It involves focusing on your mental state, trying to be present and aware, and acknowledging your feelings, thoughts and sensations. This ties in very closely with learning how to lucid dream and interpreting the meaning of our dreams. It's important to think about every element of your dream: where you are, what you're doing and how you're feeling. The place you dream about reveals a lot about your state of mind. For instance, if you dream about the office, your mind may be focused on work. Are your dreams ordinary or fantasy-filled? Are you trying to resolve issues in your everyday life or are you looking for an escape? Do you feel happy, anxious or inspired? The more time you spend reflecting on your dreams and trying to decode them, the more you'll achieve. You may not want to admit the truth, but your dreams will help you and, in turn, you'll feel more mindful. Try writing down your thoughts too. This may help make their meaning more clear and you can come back to these at any time.

Can cold rooms cause bad dreams?

While it's a myth that cold rooms cause nightmares, it's true that if you're too hot or too cold you won't sleep as well, and you may have bad dreams as a result. You want ideal sleeping conditions. Also consider what you have eaten and the day you have had, as these may influence your dreams too.

PRACTISE YOUR SLEEP MANTRA

Once you're ready to go to bed, it's a good idea to repeat your dream mantra either out loud or in your head. Think about what you'd like to dream about. If you focus on these, it will help you dream about them. You can even make a note of them in your dream journal.

CREATE A RELAXING SLEEP ENVIRONMENT

To help you have a positive dream experience, you'll want to de-stress and put yourself in a relaxed state before you go to sleep. A quiet, dark room will help you sleep, and don't forget to keep a notebook by your bed to record your dreams. Write down five things you can do to create a relaxing sleep environment.

HAVE A MINDFUL BEDTIME ROUTINE

Whether it's drinking camomile tea, moisturising or meditating, make sure the hour before you go to bed is stress-free and calming. Write down what your bedtime routine is and how you can be more mindful before bed.

CLEAR YOUR MIND

If you've had a busy day, you'll want to declutter your brain before you go to sleep to avoid bad dreams. Try writing down five positive things from your day, or perhaps write down what frustrated you and how you plan to work through the issue. Then take deep breaths and clear your mind.

GET A GOOD NIGHT'S SLEEP

Good dreams go hand in hand with a good night's sleep. Try to work out how many hours of sleep you need to feel rested, and try to keep the amount of sleep you get consistent. If it helps, you can write down how much sleep you get each night to work this out.

THE SCIENCE OF emotions



How our ancient brains evolved the perfect way to keep us safe by controlling the chemicals in our minds to moderate our behaviour

WORDS CHARLIE EVANS

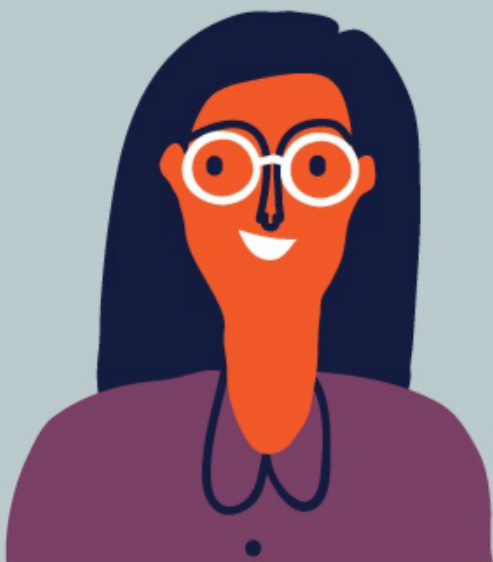
How are you feeling right now? Are you relaxed laying on your sofa and listening to the gentle sounds of the dawn chorus outside your window? Or maybe you are tense with your shoulders hunched up around yourself as you try to get five minutes' peace in a busy office? You would think that it is easy to work out if we are happy or sad, angry or calm,

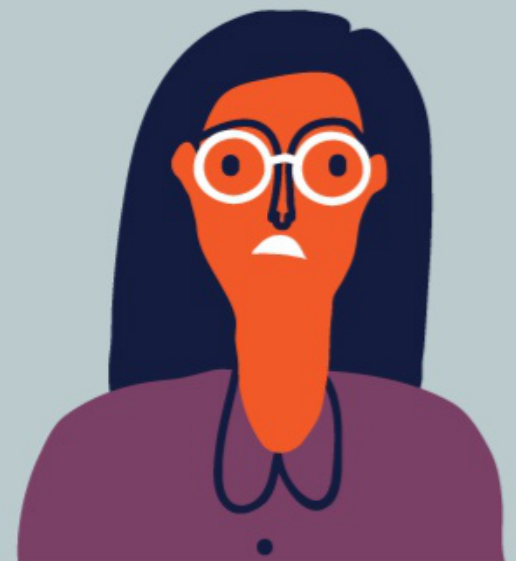
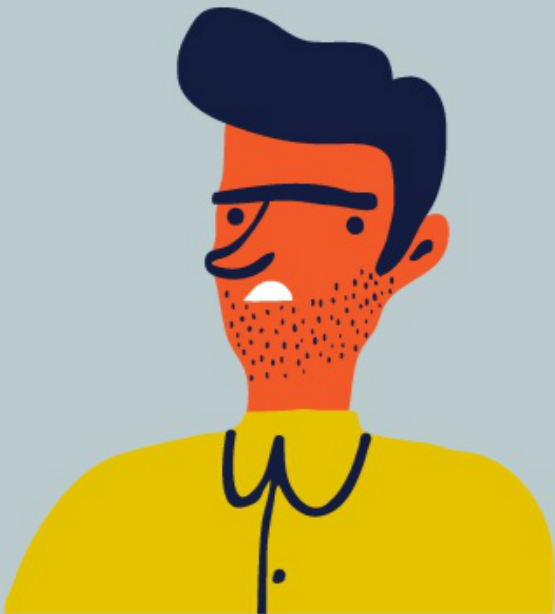
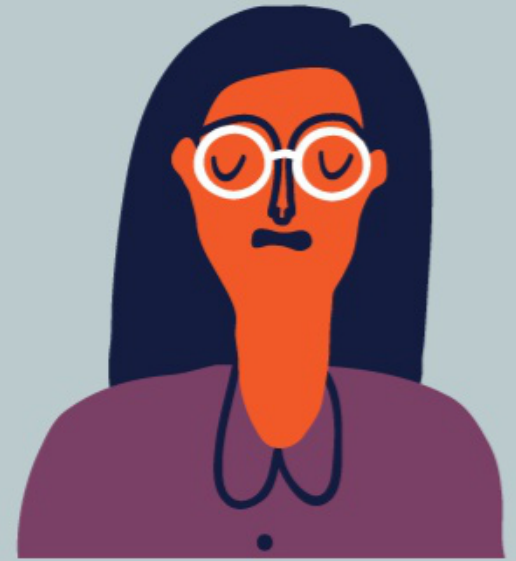
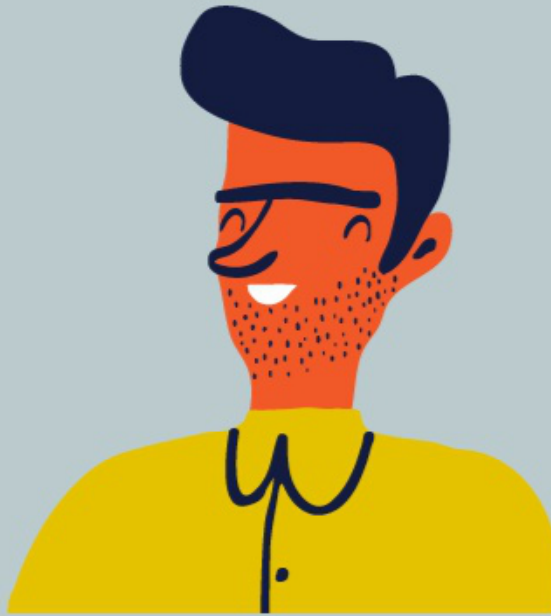
but humans cycle through such a vast array of emotions throughout their lives it can be difficult to distinguish them from one another.

Emotions are not a simple experience. Every time you feel something, your body initiates a physiological change, a chemical release and a behavioural response. This process involves multiple processes working together, including your major organs, neurotransmitters and limbic system. Your

limbic system is the most primordial part of your brain, thought to have first evolved in early mammals. It's filled with ancient neural pathways that activate our emotions in response to stimuli, and controls our fight-or-flight response through the autonomic nervous system.

This response evolved from a need to make decisions based on our emotions. As our body fills with adrenaline and our heart starts »





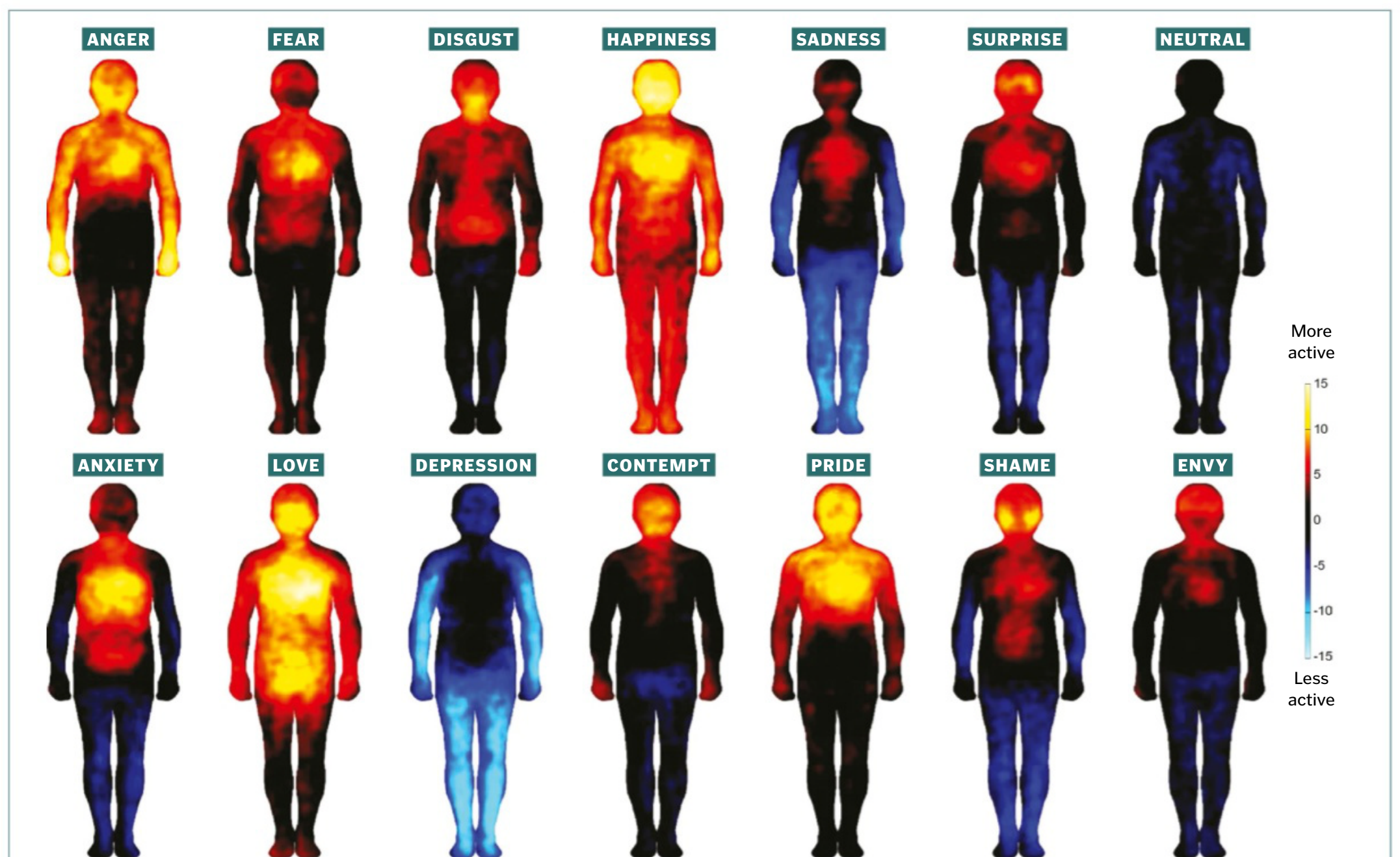
racing we prepare to react. Do we stay to fight the bear that has come scavenging for food, or do we flee to somewhere safe? We can still feel the effects of this response. When we are confronted for not doing the dishes we might feel the same fight-or-flight response as our adrenaline starts to flood our system. Our heart rate and breathing increases, the fine hairs on our arms might stand on end, and our hands feel clammy as we decide if we are going to stay and argue or if we are going to escape to the safety of our bedroom.

The biological sensations in our bodies in response to emotions can feel very similar to one another. Imagine your palms sweating, feeling your cheeks warm as they flush red, and your heart pounding in your chest. You could feel this because you are sitting

nervously in the dentist's waiting room, or you could be excited as you wait to see your loved ones after they return from a holiday – the physiological reaction is the same. The interpretation of emotions is our logical brain rationalising these responses and describing them as feelings. We take into consideration the context and label our emotions accordingly. However, we don't all do this the same way. Because our bodies cause different floods of chemicals in response to different environmental triggers, each person naturally reacts to situations differently.

Have you ever seen someone who is being berated in a meeting but facing the onslaught with nothing more than a slightly raised eyebrow? Or watched as someone finds out some bad news but keeps their »

“READING THE EMOTIONS OF OTHERS IS A VITAL SKILL FOR NAVIGATING OUR WAY THROUGH LIFE”



EMOTIONS AS SENSATIONS

We feel our emotions, and not just in our head and heart – our bodily state changes to react to the chemical storm in our system. We might feel a tight knot in our stomach as we dread walking onto a stage to give a speech, or we might feel our cheeks flush red when we answer a question wrong.

Researchers from Aalto University in Finland explored how humans physically feel

their emotions by mapping the sensations topographically. Their findings were consistent across Western European and East Asian cultures, which suggests the way people feel during an emotional experience stems from a biological source rather than a cultural interpretation. The study also highlighted that emotions adjust our bodily state to either prepare ourselves physically

to fight or flee, or to encourage us to seek out enjoyable social reactions.

The study included more than 700 participants from Finland, Sweden and Taiwan, and researchers induced different emotional states before asking them to colour bodily areas on images of the human body to describe in which areas they felt activity increasing or decreasing.

THE ANATOMY OF EMOTIONS

Different areas of your brain and body are stimulated by different emotions

ANTERIOR CINGULATE CORTEX

This area is involved in assigning emotions to internal and external stimuli and is responsible for the vocalisations associated with our emotional states.

POSTERIOR CINGULATE CORTEX

This region is responsible for the recall of emotional memories, and it is stimulated when we daydream or recall past experiences.

PARAHIPPOCAMPAL GYRUS

This area is responsible for storing emotional memories, and visual and auditory processing. It helps us interpret what we are feeling based on the context.

HYPOTHALAMUS

This region regulates hormones and controls the autonomic nervous system in response to stimuli. It can trigger the release of insulin, increase heart rate or redirect blood flow, for example.

HIPPOCAMPUS

The hippocampus is responsible for making memories. It can help us regulate our emotions by allowing us to compare events to similar past experiences.

AMYGDALA

This small structure is responsible for detecting fear and preparing our bodies for an emergency. Stimulation of this area causes anxiety and defensive behaviour.

SEPTAL NUCLEI (NOT VISIBLE)

These structures (located near the hypothalamus) are linked with feelings of social connection. They are particularly active when we have positive feelings towards others, such as unconditional trust or empathy.

CHEMICAL MESSENGERS

When a nerve impulse reaches a synapse, it cannot jump directly to the next neuron. Instead, it triggers the vesicles (larger pink spheres) to release neurotransmitters (small pink spheres).

CENTRE OF EMOTION

Your brain recognises external stimuli and generates a physical and emotional response. It can do this even when we are not consciously aware of the stimulus itself.

PHYSICAL RESPONSES

Our emotions can lead to changes in our bodies, such as the feeling of 'butterflies' in your stomach, your heart racing, and so on.

MIND THE GAP

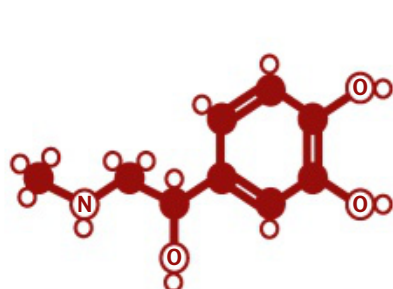
The neurotransmitters diffuse across a gap known as the synaptic cleft to reach the next neuron via receptors (beige).

TRANSMISSION

When the neurotransmitters bind to the receptors, they cause the neuron's ion channels to open, letting ions (small, yellow spheres) flow in, triggering the next nerve impulse.

THE CHEMISTRY OF EMOTIONS

Where two neurons meet, a very small gap (synapse) exists between them. The electrical impulse travelling along the axon of the neuron must convert into a chemical signal to bridge this gap. The chemicals that do this are called neurotransmitters. These so-called chemical messengers are involved in our different responses to situations. Your emotions depend on fluctuating levels of neurotransmitters, which cause the activation of different parts of the brain responsible for different moods, or activate parts of the brain that trigger the stimulation of the autonomic nervous system.



ADRENALINE

Released by the adrenal glands that sit on top of each kidney, adrenaline increases the flow of blood to our muscles, raises our heart rate and dilates our pupils. It is crucial in our fight-or-flight survival response.



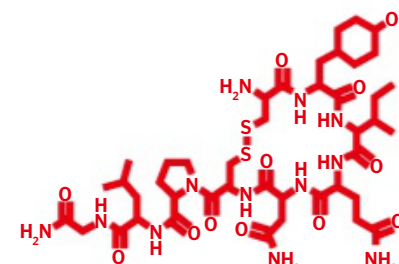
NORADRENALINE

Similar to adrenaline, the release of this chemical can result in increased levels of alertness, helping to prime us for action if needed. It also increases our blood pressure and widens our air passages.



DOPAMINE

This is the addictive reward chemical that your brain craves. It serves to motivate you to seek out the things you need for your survival. We can sometimes find ourselves enslaved by this ancient reward mechanism.



OXYTOCIN

Also known as the 'cuddle hormone', oxytocin is released when you're close to another person. It's essential for making strong social bonds, and it's also a key part of why we want to trust people.



GABA

Responsible for regulating muscle tone, gamma-Aminobutyric acid (GABA) also regulates the communication between brain cells. It can calm us down by reducing the rate at which our neurons fire.



ACETYLCHOLINE

This is the main neurotransmitter in the parasympathetic nervous system that slows our heart rate, contracts smooth muscles, dilates blood vessels and increases bodily secretions.



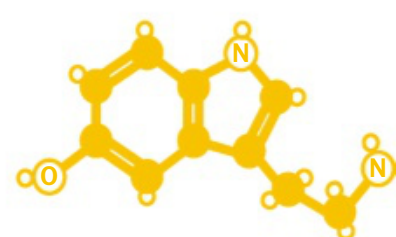
GLUTAMATE

The most abundant neurotransmitter in the vertebrate nervous system, glutamate is used by nerve cells to transmit signals to other cells. Too much of it can cause cognitive impairments.



ENDORPHINS

Triggered by the sensation of pain, endorphins work to inhibit the transmission of pain signals. Capable of producing a sense of euphoria, studies have suggested endorphins may also be stimulated by laughter.



SEROTONIN

Serotonin is linked to our wellbeing and happiness, and our levels of it are affected by exercise and exposure to sunlight. It also helps to regulate our mood balance, sleep cycle and digestion.

composure? You are sure that you would have raised your voice or burst into tears, but our responses are defined by how our neurons are networked together. Our past experiences and genetic predispositions influence our brain chemistry and therefore our physiological responses, which in turn determine how we react to various situations – like someone cancelling on us last minute, or having a friend surprise us by showing up at the front door unannounced.

At times our emotions can seem like an irrational response, but our brains have carefully evolved these mechanisms with just one target: keeping us alive. While we interpret different emotions as positive or negative, the most ancient parts of the human brain developed them on the principle that we must survive. We evolved emotions as a means of communicative function and to help us navigate social interactions and our environment safely: they are designed to protect us. Our fear responses were originally a survival tactic that warned us of potential dangers, such as our innate unease around spiders and snakes. Then there is the feeling of disgust, which warns us of foods or other substances that may be dangerous.

Our other emotions are responses to social interactions that keep us part of a group. We are fundamentally a social species, and throughout our evolution have relied on our

tribe to help us survive by working together to find food and shelter. Anger is a response to perceived social threats or a signal of dominance, pride can help us to boost our social status, while shame is intended to decrease our standing within a group. These emotions maintain the social balance of our tribe – who we follow, who we trust, who we care about.

The fundamental emotions that motivate us individually are almost always sadness and happiness. Sadness results from loss, and serves the biological purpose of motivating a person to recover that loss, whether it is a young child searching for their mother in a supermarket, or trying hard to get a new job after being dismissed. But the ultimate human emotion is happiness, and we are all in search of it.

When you're sitting around a campfire, safe in the countryside with some close friends and good food, you feel happiness because you have found the resources that your primitive brain is seeking. Our species is drawn so much to happiness because this emotion is our brain's reward system for finding environments where we are free from threat. A healthy human brain copes with sadness when social bonds are broken, communicates with our loved ones and can recognise and regulate our emotions even when they do not feel particularly positive.

The next time you sit in an airport departure lounge, look for the emotions. Our bodies have created these experiences – the tears as we say goodbye, the smiles and laughter as we are reunited – for the purpose of keeping us alive. Our emotions and feelings are fundamentally what make us human, but it means we're in for a bit of a rollercoaster along the way. ■

HOW MANY EMOTIONS DO WE HAVE?

It has long been thought that there are only six different emotions: anger, disgust, fear, happiness, sadness and surprise. It has been hypothesised that any other emotions are just a combination of these basic feelings, such as anticipation being caused by a mixture of fear and happiness. However, a recent study published in *Proceedings of the National Academy of Sciences of the United States of America* from researchers at UC Berkeley suggests that we may have many more emotions that are distinctively different to one another, but still related. The study used 2,185 short videos with the intent to evoke emotions in the 853 participants. Clips included a cute baby playing with some fluffy puppies, a man holding a tarantula inside his mouth, and a happy couple getting married. Participants were asked to record how the videos made them feel and how strongly it evoked a response. The study suggests that there are 27 distinct emotions, including awe, awkwardness, calmness, confusion, disgust, nostalgia, sadness, sympathy, horror and triumph.

“WE FEEL OUR EMOTIONS, AND NOT JUST IN OUR HEAD AND HEART – OUR BODILY STATE CHANGES TO REACT TO THE CHEMICAL STORM IN OUR SYSTEM”

UNIVERSAL EXPRESSIONS

Reading the emotions of others is a vital skill for navigating our way through life – it would be awkward to misunderstand your friend as happy when they're actually angry with you.

There has been a long-established view that the way we express our feelings using facial expressions is universal and crosses all cultures for seven basic emotions: anger, disgust, fear, joy, sadness, surprise and contempt. For over a century, studies have explored the theory of universal expression by asking people to interpret

photos displaying various emotions, although there are some cultures around the world that do not have the same perception of certain emotions.

One study found that people living in the Trobriand Islands off Papua New Guinea didn't interpret images of people who were wide-eyed with their lips parted as they gasped as a sign of fear. Instead, the Trobrianders interpreted this emotion as anger. This research is some of the first to suggest that how we express our emotions is not universal, and may differ between societies.

Build **BETTER** *relationships*

You may not have the ability to change other people but you do have the power to improve your relationship with them



WORDS SARA NIVEN

How do you get on with those around you – your partner, children, parents, siblings, even colleagues at work? Would you describe your relationships as good in the main or do things often feel strained with definite room for improvement?

Although when we talk about relationships in general, romantic ones first tend to spring to mind, but our attachments and interactions with other people in our life can be similarly significant.

“Relationships are key to our health and happiness and give meaning and purpose to our lives,” confirms chartered clinical psychologist and author Dr Jessamy Hibberd. “We’re highly social beings and early humans needed to live together and get on in a group to ensure survival. This means we have a deep need for social inclusion and research shows that a lack of social support is as bad for you as smoking. Social isolation is associated with heightened risk of disease and early death, whereas warm and supportive relationships have long-term benefits for health and longevity.”

If a relationship isn’t going well, we may find ourselves harbouring feelings of anger, resentment, guilt or general sadness, depending on the situation and how it impacts on us. For a relationship that has seriously broken down, be this due to a betrayal, major disagreement or other factors such as drug or alcohol addiction, professional help may be the best option to try to work through it, either by seeing a counsellor alone or ideally in the form of couples or family therapy. Unfortunately though, even with the best will in the world,

sometimes it can be healthier to walk away (easier with some types of relationships than others, of course).

The good news is that when it comes to the daily niggles and gripes everyone has or unhelpful patterns of communication we may have fallen into with our nearest and dearest, a lot can be done to improve matters.

Here we look at five factors to bear in mind for building better relationships.

Lend an ear

Possibly one of the most powerful tools in the relationship improvements box, active listening is very different from sitting nodding, wondering when you will get your chance »



WHEN TO SEEK PROFESSIONAL HELP

However hard one person tries, sometimes it’s not enough to get a relationship back on track, and it can be worth seeking professional help if you want to try to salvage it.

“Every relationship has ups and downs, and arguments in themselves aren’t necessarily a bad or unhealthy thing if they lead to issues being resolved,” says Dee Holmes of Relate. “When something seems to be continually looping around however, and arguments become less about practicalities and more of a personal attack with insults and resentment building, that is a red flag warning sign. Counselling with a qualified couple or family therapist can provide a safe space, free from distractions for people to start to get to the bottom of what the real issues are and how to work through them. It ensures a discussion doesn’t escalate into just another row and the counsellor can reflect back what they are seeing going on to help additionally.”

To find out more about Relate and the services offered, visit www.relate.org.uk.

to speak or carry on with whatever you were doing. And it is the complete opposite of muttering 'Uh huh,' while browsing your phone as someone tries to tell you about their day.

"We have so many pressures, distractions and pulls on our attention that it can be difficult to be fully present even with those closest to us but ensuring someone feels heard and understood is really important,"

“ ACTIVE LISTENING CAN TAKE PRACTICE BUT IS WORTH THE EFFORT ”

confirms Dr Hibberd, author of *The Imposter Cure*, (Octopus, £12.99).

Pointers for active listening include good eye contact (not staring intently, which can be intimidating), open body language (leaning towards the other person and avoiding crossed arms and legs), and an awareness of when to respond and when to stay quiet.

It's important not to interrupt or immediately override someone's story with one of your own - 'You think that was a bad day, that's nothing - wait 'til you hear mine!'

Instead, when they finish speaking, try showing that you have been listening by summing up what they've been saying without judgement and with an invitation for them to continue. 'So, it sounds as though you felt disappointed today because you didn't get the feedback you were hoping and had worked hard for?'

For something seemingly so simple, active listening can take practice (it is a learned skill when people train to become counsellors,

for instance) but is definitely worth the effort in terms of the difference it can make in any kind of relationship.

A balancing act

Relationship expert, therapist and author Dr John Gottman extensively researched the secret of lasting, healthy relationships and noted that the couples with these clock up five positive interactions for every negative one. Dr Gottman even claimed to be able to predict the marriages heading for divorce based on this magic 5:1 ratio.

"The bottom line: even though some level of negativity is necessary for a stable relationship, positivity is what nourishes your love," his website states.

An interaction can be as simple as a loving touch or gesture such as reaching for our partner's hand or simply an experience of being listened to attentively, as described previously. A negative one can include something neutral like failing to make a »



CHILD'S PLAY

If you are a parent, building a healthy and trusting relationship with your child is probably one of the most important things you will ever do. You are effectively helping to shape another human being's self-esteem, and providing them with a good grounding for later life.

"When you communicate well with your child, it leads to a strong relationship, greater cooperation, and feelings of worth," confirms therapist Zinny Perryman, who has specialised in working with children and family interventions. "If the opposite is the case, it can lead to your child switching off, conflict and feelings of worthlessness. They are far less likely to open up about any difficulties or worries and it can be easy to lose touch with what is going on for them."

She advises:

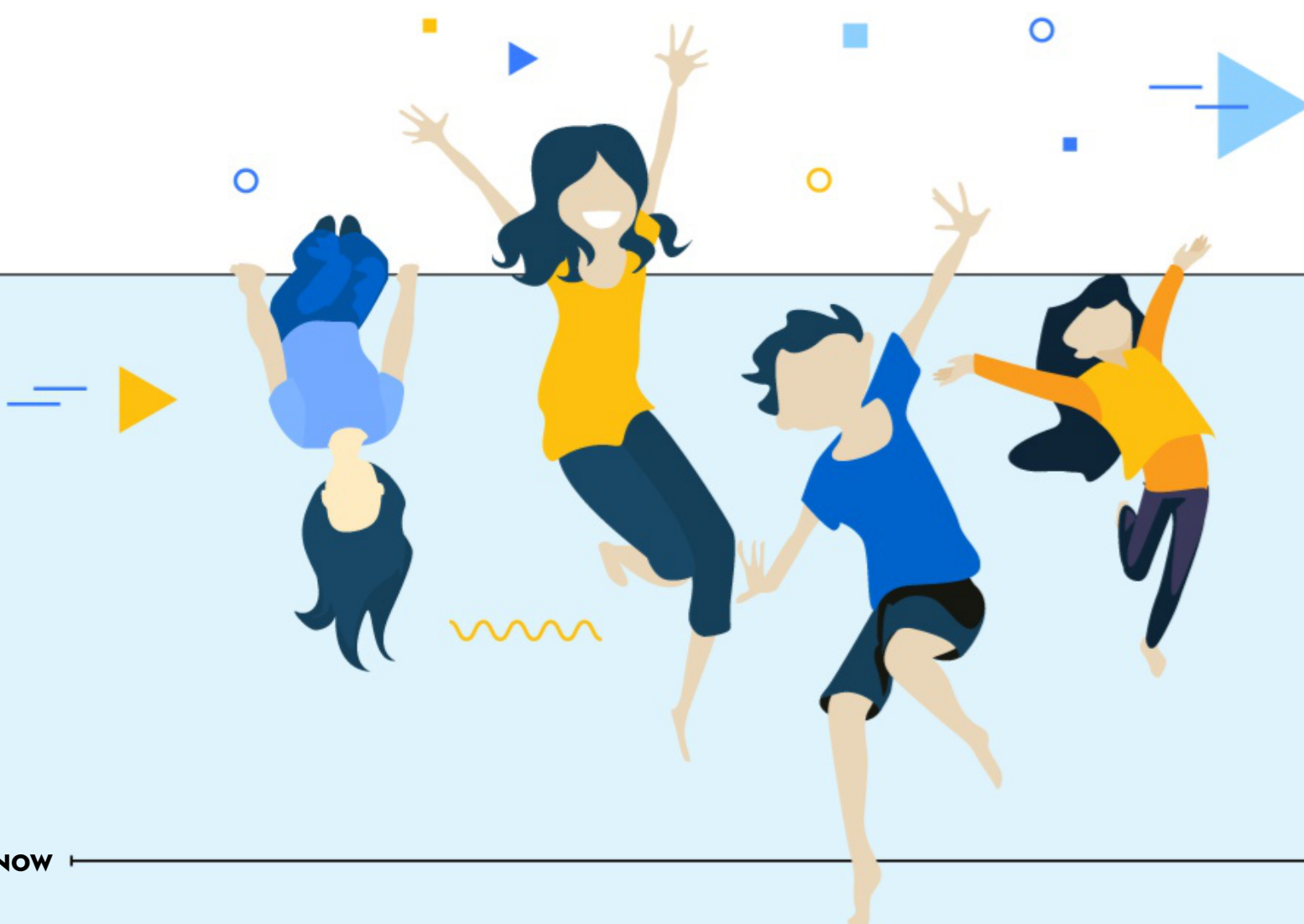
Be as courteous to your child as you would a close friend. If you regularly interrupt them halfway through a story or break off to pay attention to something else, you are sending the message that what they have to say isn't important.

Unless other people are specifically meant to be included in the discussion, hold important conversations with your children in private. Embarrassing them or putting them on the spot in front of others will lead only to resentment and hostility.

Avoid towering over younger children. Physically get down to their level to talk face to face.

Use 'door opener' statements like 'That's really interesting' or 'Tell me more about that' to encourage your child to share ideas and feelings and show you are interested and respect what they have to say. Your tone needs to be genuine and your focus on them.

If you are very angry about something, unless it is an emergency that needs addressing immediately, wait until you feel calmer and more objective. Address the behaviour rather than labelling the child - they may have done something you view as stupid or bad but they are not a stupid, bad child. Your child needs to feel accepted even if their behaviour isn't.



comment on something our partner shows us as well as dismissive or critical statements such as shrugging our shoulders to indicate we don't care or rolling our eyes sarcastically.

Dr Gottman stresses that couples need to regularly demonstrate appreciation and respect for one another, something that sometimes gets lost over time. Although his balance theory has been developed to apply specifically to couples, there may be lessons that can be taken on board for other relationships given that everyone has a need for appreciation and we can all be guilty of taking others for granted.

Make the time

Without quality time together, it's easy to lose touch with what's going on in someone else's life, even when we're living under the same roof. We also have less shared, positive experiences to cushion the difficult times or negative experiences, becoming ships that pass in the night, or even ships set on a clear collision course whenever the sea gets stormy!

"Quality time doesn't have to involve hours, it could be as little as half an hour or even ten minutes in some cases," explains family and couples counsellor Dee Holmes, who is a senior practice consultant for Relate. "It is about managing that time and keeping it free from distractions. If your partner or child wants



A FRIEND INDEED

A good friend is worth their weight in gold but when life is busy, how often do you manage a catch up? With some people boasting hundreds of 'friends' on Facebook, it can be all too easy for friendships to become more virtual than real. Perhaps you used to send cards but now it is much easier to post a quick 'Happy Birthday,' or you've been messaging a friend for months but neither of you have actually spoken on the phone for a year, let alone met up to see each other in person.

If this sounds familiar, it really can be worth making a little effort to bring a friendship back to (real) life. An unexpected phone call just to ask how they are, a card or ideally an arrangement to meet (that doesn't get postponed or cancelled so many times it never happens) can make all the difference, as will taking a genuine interest in what is going on in their life as opposed to only wanting to tell them about what is going on in yours.

You never know when you will need your friends so it is worth cultivating them and showing them how much they mean to you rather than leaving them feeling you only ever reach out in a crisis.

your company or attention and you have no choice but to take an urgent call or dash off for an appointment then be honest and let them know when you will be available for them later. But it is a good idea to build in pockets of regular time for family members – perhaps you decide that for half an hour after your child comes home from school you will spend that time uninterrupted with them or when your partner gets back from work you make a habit of having a cup of tea together."

While quality time can involve watching TV or a film together, Holmes stresses that an important aspect is the togetherness of an activity rather than simply people's proximity.

"I see children walking to school glued to their phones like zombies when previously they would have been chatting to friends walking alongside them," she observes. "Similarly, families can often be in the same room, all on different devices without any communication and it is something we hear complaints about in the counselling room. It can be a good idea to set healthy boundaries regarding the use of social media, such as no phones at the dinner table or during a certain time of day. These boundaries will be different for each family."

Dr Hibberd agrees on the significance of time and how it is spent. "Having experiences together is important in relationships, whether that's something major or something as simple as sharing a meal or a joke."

“WE CAN'T ASSUME OTHERS, EVEN THOSE CLOSEST TO US, WILL BE MIND READERS”

Explanations and understanding

Have you ever experienced a situation where someone stomps around, slamming doors with a pained, angry expression on their face, leaving you unsure if you have upset them, and feeling it is best to stay out of the way?

Later you discover they were stressed over something completely unrelated to you, or alternatively they thought they were sending out a clear message they were tired and needed help but you had no idea.

“When difficulties arise in a relationship, I often ask people if they have told those close to them how they feel and am often told they would expect that person to already know,” explains Relate’s Dee Holmes. “But we can’t assume others, even those closest to us, will be mind readers. They may interpret a situation completely differently or not

have a clue you see something as a problem as it hasn’t been the case in a previous relationship. You can’t underestimate the power of explaining.”

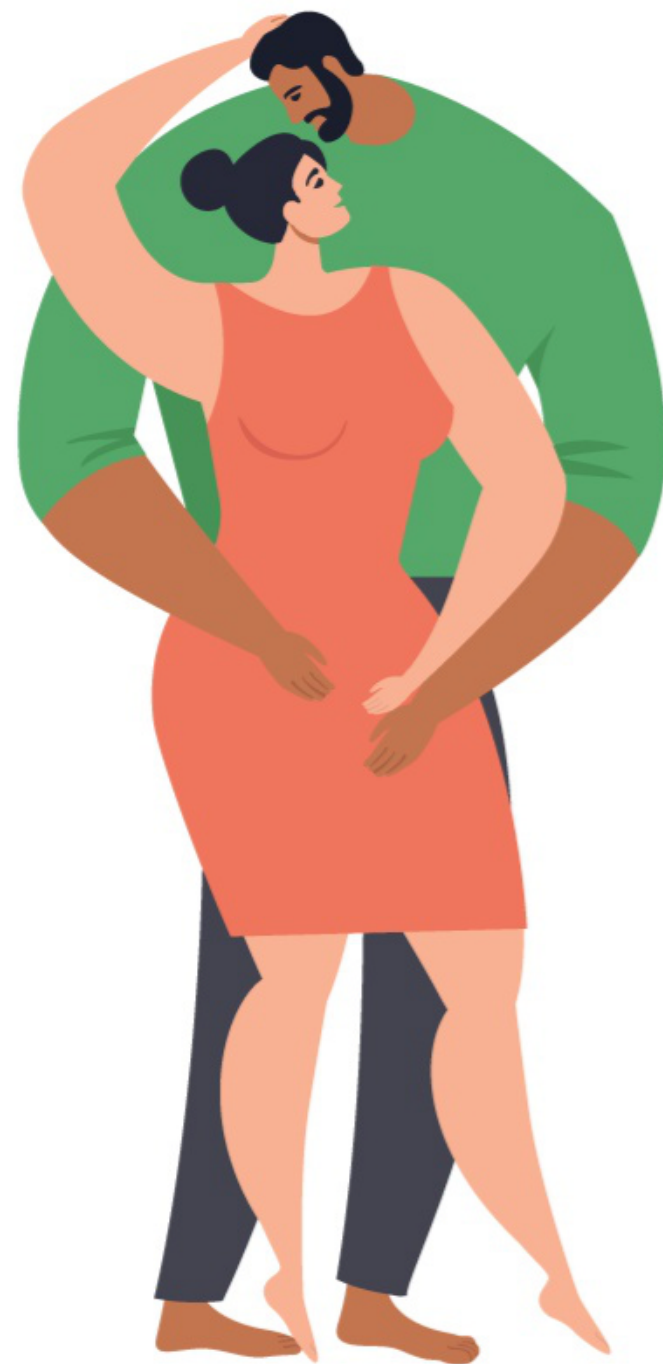
She points out that it is also easy for miscommunication to arise when using text or WhatsApp, where there is no tone of voice or body language to help with communication. However, there may be times when writing things down can be useful in opening up lines of communication.

“For a situation in a family that continues to cause issues or arguments, you might suggest everyone writes down three things they feel would be helpful in resolving it and then sit and discuss them. Sometimes writing a letter to a partner, parent or friend could be a useful exercise if you find something very difficult to broach face to face or think they may not let you finish what you want to say.”

Role play

If you’ve ever noticed that your interactions with different people vary and they seem to bring out different sides of you, welcome to the world of Transactional Analysis, or TA.

This is a theory developed in the 1950s that is used by some therapists to help explain why we think, feel and behave the way we do, particularly when it comes to our relationships with others. Very simply put, the theory involves three sub personalities known as ego states - Parent, Adult and Child - that we regularly switch between (with



some further divisions within these, such as Nurturing Parent and Critical Parent).

It explains that we take on different roles depending on who we are dealing with and how we feel at that time, and it can be easy to fall into unhelpful patterns and roles. Realising we are doing this provides the opportunity to shift gears into a response that can improve interactions and relationships.


For example, if you are regularly annoyed with your partner about not doing their share of household chores, it can be easy to assume the role of Critical Parent and come out with an angry, judgemental statement.

Switching into our rational Adult ego state means we might say something like ‘I feel I’ve been doing most of the chores this week and am really tired. I know you’re working hard too but I’d appreciate help tonight’.

This invites the other person to (hopefully) respond as an adult as opposed to taking on the role of sulky child or becoming critical themselves and telling you all the things they feel you haven’t done that week, with the risk of the conversation escalating into a row.

Our relationships, whether with relatives, partners, children, friends or colleagues, are wonderful things and enrich our lives. By being more aware of them, we should all get more out of our own relationships. ■

THE POWER OF *imagination*



The human brain has the unique ability to take what it knows and dream up something new

WORDS LAURA MEARS

Can you imagine a purple dragon riding a bicycle with three wheels? No other animal on the planet has that power. You have the ability to take mental images of objects you've seen before, break them down into their component parts and rebuild them into something new.

Combine a reptile and a bird and you have your dragon. Recall the purple colour of a flower and you can paint its skin. Think about the mechanics of riding a bicycle and you'll be able to position its body on the frame, forelegs on the handlebars, hindlegs on the pedals. Now you just need to decide where you want to put that third wheel. This skill is incredible, and it's shaped the course of human history. Culture, engineering, art, science, music, technology: these things are only possible because we can make things

up. But the ability to imagine hasn't always been there.


When modern humans started migrating out of Africa around 100,000 years ago, they were still using the same simple tools as their ancestors. It was another 60,000 years before human creativity really started to explode.

Between the emergence of modern humans and the 'creative explosion', mutations in our genes slowed down the development of the brain's processor, the prefrontal cortex. This enabled the thinking part of our brain to get much bigger, and this in turn enabled our skills of visual processing and language to combine. Neuroscientist Andrey Vyshedskiy argues that this was the catalyst for imagination.

Of course, other animals can communicate and process visual information, but the way that we do it is unique.

Scientists think that the ability to make mental pictures exists across the animal kingdom. It's a phenomenon known as 'imagery'. But it's not the same as imagination. Take bicycles, for example. When we see a bicycle, networks of neurons fire in the visual processing regions of our brains. To store a memory of what the bicycle looks like, the brain needs to remember which neurons lit up. To do this, it strengthens the connections between them. This is a principle known as Hebbian learning - 'nerves that fire together, wire together'.

The result is that the brain forms a web of connected nerve cells that represent a bicycle, together known as a neuronal ensemble. To get the mental picture of the bicycle back, all the brain needs to do is reactivate the same connections. There's evidence that rats can do this to fill in the »



“ CULTURE, ENGINEERING,
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blanks when something's happening outside of their field of view; they use mental images to deal with missing information. But we can take it one step further.

Rather than simply recalling patterns we have already seen, we can use old patterns to invent something completely new. To do this, we borrow skills from the way we communicate.

Other animals also have language, but none quite like our own. Across most of the rest of the animal kingdom, language is non-syntactic. This means that animals talk about whole situations all at once. A bit like reactivating the whole mental image of the bicycle. The thing we can do differently is break situations down and talk about them in parts, known as 'syntactic language'. This makes room for us to reassemble the parts in a different order or take parts of different ideas and combine them together.

It's the combination of syntactic language and mental images that make imagination possible. Together they enable 'mental synthesis': the ability to break visual ideas apart and put them back together to conjure up objects that have never existed.

To imagine a dragon riding a bicycle, we need to connect the mental ensembles for the different concepts and activate them together. For this to work,

CAN ANIMALS IMAGINE?

Chimpanzees are our closest living relatives, but they don't seem to have the same powers of imagination as we do

Animals can make mental images of things they've seen before. They seem to dream, with parts of their brains lighting up in the same patterns that they did during the day. They might even be able to conjure mental pictures of potential future events, enabling them to plan ahead. But the question is, can they do what we can do and mash different ideas together to invent something completely unexpected? Perhaps not.

The search for animal imagination has led scientists to our closest living relatives, chimpanzees, and, like human children, they do seem capable of imaginary play. In a famous example, a chimpanzee named Viki pretended to pull a toy on a string, even seeming to stop to free it when it became stuck on an imaginary obstacle. Another chimp, Kanzi, pretended to hide food in bushes and then pretended to eat it. He even shared his imaginary food with others and watched to see whether they would eat it too. But in both cases, the chimps were imagining behaviours that they had experienced before. The thing that animals don't seem to be capable of, as far as we know, is to imagine completely new things. This skill seems to be unique to our species.

the signals from different parts of the brain have to arrive at the same time, and this takes some coordination.

The connections responsible are neural fibres that link the prefrontal cortex to the occipital lobes. Different neural fibres have different lengths, so for imagination to work, the brain needs to change the speed at which they pass their messages. This helps to ensure that the messages arrive together. The brain does this by wrapping the fibres in varying thicknesses of myelin insulation: the thicker the wrapping, the faster the fibres transmit.

Changes to nerve fibre insulation happen during childhood, when our brains are at their most plastic. When we're young, our brains also prune and refine the connections between different brain regions. This makes childhood a critical time for developing the skills of imagination, and it's something we practise a lot. While other young animals might fight, climb and run to practise the skills they need as adults, our species is the only one that seems to engage in make-believe. Imaginary friends are found nowhere else in the animal kingdom; we seem to have a unique gift for fiction.

The power of our imagination extends far beyond mental pictures of bicycle-riding dragons. Our brains contain 'mirror circuits' that activate not only when we do or experience something but when we see someone else do or experience the same thing too. For example, when we watch someone ride a bike, the centres in our brain that control movement light up. When we see someone fall off their bike, the parts of our brains involved in processing emotion switch on. These traces enable us to picture an experience in our mind's eye. And, like mental images, we can break them down and recombine them to imagine something new.

When children reach the age of around four or five, they also develop a complex imagination skill called theory of mind. This is the ability to understand that mental states – like knowledge, desires and emotions – can belong to us or belong to others. This lets us identify the goals of those around us, understand their beliefs and understand that what people say and what they mean aren't necessarily the same.

The neuronal ensembles that we build have many complex and interlinking components. It's the ability to take all this stored information, break it into parts and put it back together that makes our imagination so powerful.

By the time we reach adulthood, we have a sophisticated ability to plan ahead. We can run through potential scenarios in our minds and attempt to solve problems before they arise. This lets us prepare in advance. We can compare more than one possible outcome, prepare for both, or weigh up which is more likely. We can imagine things that have never existed and that will never exist. And we can run simulations to find out what it feels like to experience things we've never experienced before.

To access these superpowers of imagination, we use two large networks of brain cells known as the 'executive

attention network' and the 'default network'.

The executive attention network sits between the outer parts of the prefrontal cortex and the parietal lobe. It taps into your short-term memory and is especially active when you're focused on solving a problem. This part of your imagination is laser-focused, but its creative powers have limits.

A task as simple as rotating a shape in your mind's eye involves at least 12 separate regions of the brain. Brain cells communicate across these different locations, creating what scientists call a 'mental workspace'. But to create the focus needed to solve difficult problems like this, the executive attention network does its best to cut out distractions from other areas. This helps to get the job done, but it doesn't allow room for random thoughts, and it's randomness that makes imagination so powerful.

To access your full creative capacity, you must relax into the default network, the part of the brain that lights up when your mind starts to wander.

The main areas involved in the default network are the medial prefrontal cortex and the posterior cingulate cortex. Together, they handle memory, decision-making, reward and emotion.

“WE CAN IMAGINE THINGS THAT HAVE NEVER EXISTED AND THAT WILL NEVER EXIST. AND WE CAN RUN SIMULATIONS TO FIND OUT WHAT IT FEELS LIKE TO EXPERIENCE THINGS WE'VE NEVER EXPERIENCED”

When our attention is quiet and the brain enters a rest state, the default network takes control. The wandering mind is able to create and change mental images, recall episodic memories and relive thoughts and ideas, and by allowing many brain areas to be active all at once, it unleashes our unique human ability to integrate information.

One human imagination is powerful, but it's the combined imagination of the whole of humanity that has made our species such a success. It enables us to cooperate with other people on a scale much larger than any other organism on the planet, breaking down and recombining our shared experiences to reinvent the world around us.

Perhaps Albert Einstein put it best when he wrote: "Imagination is more important than knowledge. For knowledge is limited, whereas imagination embraces the entire world, stimulating progress, giving birth to evolution." ■



IN TWO *minds*

*Are men from Mars and
women from Venus? No, it's
much stranger than that...*

WORDS EDOARDO ALBERT

The first mark of how strange the study of gender differences in the brain has been is the fact that, through most of the 20th century, neuroscientists worked on the assumption that there were essentially no differences between male and female brains. While there was a difference in the areas of the brain that controlled sex hormones and sexual behaviour (primarily the hypothalamus), the scientists working in this field thought

that male and female brains were, in all other respects, basically identical. However since females, both human and animal, have hormonal cycles that affect their fertility and introduce complications into studies of brain chemistry, neuroscientists chose to simplify their studies by concentrating on the male of the species. That way, they would not have the complication of where in her hormonal cycle the female subject of the experiment was and, since male and female brains were thought to be identical, all the

findings on these male brains could safely be extrapolated to female brains. (In animal studies, single-sex experiments on male animals outnumber those on female animals by a ratio of 5.5 to 1.) According to Larry Cahill, professor of neurobiology at the University of California, this was because: "Neuroscientists (both male AND female), like the rest of medicine, have long held the very non-sexist view that, outside reproductive functions, there are no fundamental sex differences in the body, including the brain. A liver is a liver, a lung a lung, a heart a heart, a brain a brain. There are non-fundamental, unnecessarily complicating aspects of the female (cycling hormones), but not fundamental differences by this view. Thus ironically the best way to understand the fundamental in the female is to study the male. This very old and deeply ingrained medical/research view I believe powerfully aligned with a 'feminist' narrative of the past 70 years or so that also insisted that there are no sex differences in the brain."

“IGNORING DIFFERENCES BETWEEN MALE AND FEMALE BRAINS IGNORES A KEY ASPECT OF THE THEORY OF EVOLUTION”

The theory of evolution

In retrospect, this ignoring of any potential differences between male and female brains is all the stranger given that it fundamentally ignores a key aspect of the theory of evolution, the guiding paradigm of biology. As is well known, Charles Darwin advanced a theory of the evolution of new species through natural selection, that is that the individuals of any different species, while similar, have random differences. We now know this to be due to either mutations in asexual reproduction or through the inheritance of a different combination of characteristics from the parents in sexual reproduction - that when faced with the rigours of trying to survive and reproduce in a changing environment may act to increase, or decrease, the ability of the individual to pass on his or her characteristics to the next generation by having offspring. However, what is less well known among the general

population is the other pole of Darwinian evolution: sexual selection. For while there is a general struggle to survive, to find food and to avoid predators that plays out in competition between species, there is also competition within each species for potential mates. And, sometimes, these two struggles come into competition with each other. A prime example is the magnificent tail of the peacock. In its native India, and now wherever else it has been taken to ornament gardens and the estates of stately homes, the peacock attracts a peahen by the display of his tail feathers. As instruments of flight, these feathers are completely useless - indeed, worse than useless, as an experienced leopard, one of the peacock's main predators in the wild, knows to approach a displaying peacock from the rear, when the peacock's own fanned-out tail will mask the leopard's stealthy approach. But in order to convince a peahen to mate with it, a peacock needs to demonstrate both the magnificence of its tail and the ability to stay alive long enough to actually display it. From the point of »

THE BRAIN DIFFERENCE SCEPTICS

While the majority of neuroscientists accept the new findings that there are average sex differences in the brain of humans and animals and that, in humans, these differences play out in combination with a variety of familial, experiential and cultural factors, there is a small group of dissident researchers who disagree, quite vociferously, with these findings. Not stopping short of accusing their opponents of 'neurosexism', these researchers, including Dr Gina Rippon, Dr Daphna Joel and Dr Cordelia Fine, have attacked the findings of neurological difference on grounds of unconscious bias, statistical errors and over application. They argue that the brains of men and women consist of a mosaic of changing features that are very strongly influenced by cultural and environmental factors, with biological sex being a very minor factor, if a factor at all, in the differences between the sexes. Gina Rippon and Simon Baron-Cohen debated the issue at the Royal Academy in London; for those interested in the question the debate is on YouTube: *Is the brain gendered?: the debate*.



view of the peahen, it's an excellent tool for winnowing out unworthy or unlucky males. But the effect can be a runaway development of the trait desired worthy by the female until finally checked by further development of the feature rendering the male unlikely to survive. There are some cases where biologists speculate that the demands of sexual selection might have driven the species towards extinction. One such possibility is the Irish elk (*Megaloceros*), the largest deer species ever, in which the antlers grew to a quite ridiculous spread: standing 2.1 metres high at the shoulder, males had antlers spreading 3.6 metres.

Sexual selection is a major cause of sexual dimorphism within species, that is, those

“SEXUAL SELECTION IS A MAJOR CAUSE OF SEXUAL DIMORPHISM IN SPECIES”

differences between the male and female of a species other than their sexual organs. Examples of extreme sexual dimorphism in nature abound, from the bulk of the male elephant seal when compared to his relatively petite mate, to the sexual cannibalism exhibited by many species of female spiders, who are much larger than their nervously approaching potential mates and who exhibit their disdain for an unworthy suitor by eating him. They often eat the successful suitor too, although in that case only after she's had his way with him.

Sex differences in animals

So if sexual selection can cause such marked variations in animal morphology, it would seem obvious to investigate if these differences are also apparent in their brains. There had been a few studies before the 1990s that looked at sex differences in animals of which the most important was by CH Phoenix in 1959, where he demonstrated that giving pregnant guinea pigs male hormones produced female offspring that behaved like males. Phoenix concluded that “testosterone or some metabolite acts on those central nervous tissues in which patterns of sexual behavior are organized”.

Further work has proved that it is the secretion of male sex hormones by the developing male in utero that acts to masculinise the foetus - the default sex is female, and males will only be produced if the foetus is exposed to high levels of male sex hormones. Further evidence of the difference in animal brains, in songbirds this time, was provided in 1976 when Nottebohm and Arnold found that three areas in the brain controlling song in canaries and zebra finches were much larger in males than females - so much so that the difference was obvious to the naked eye.

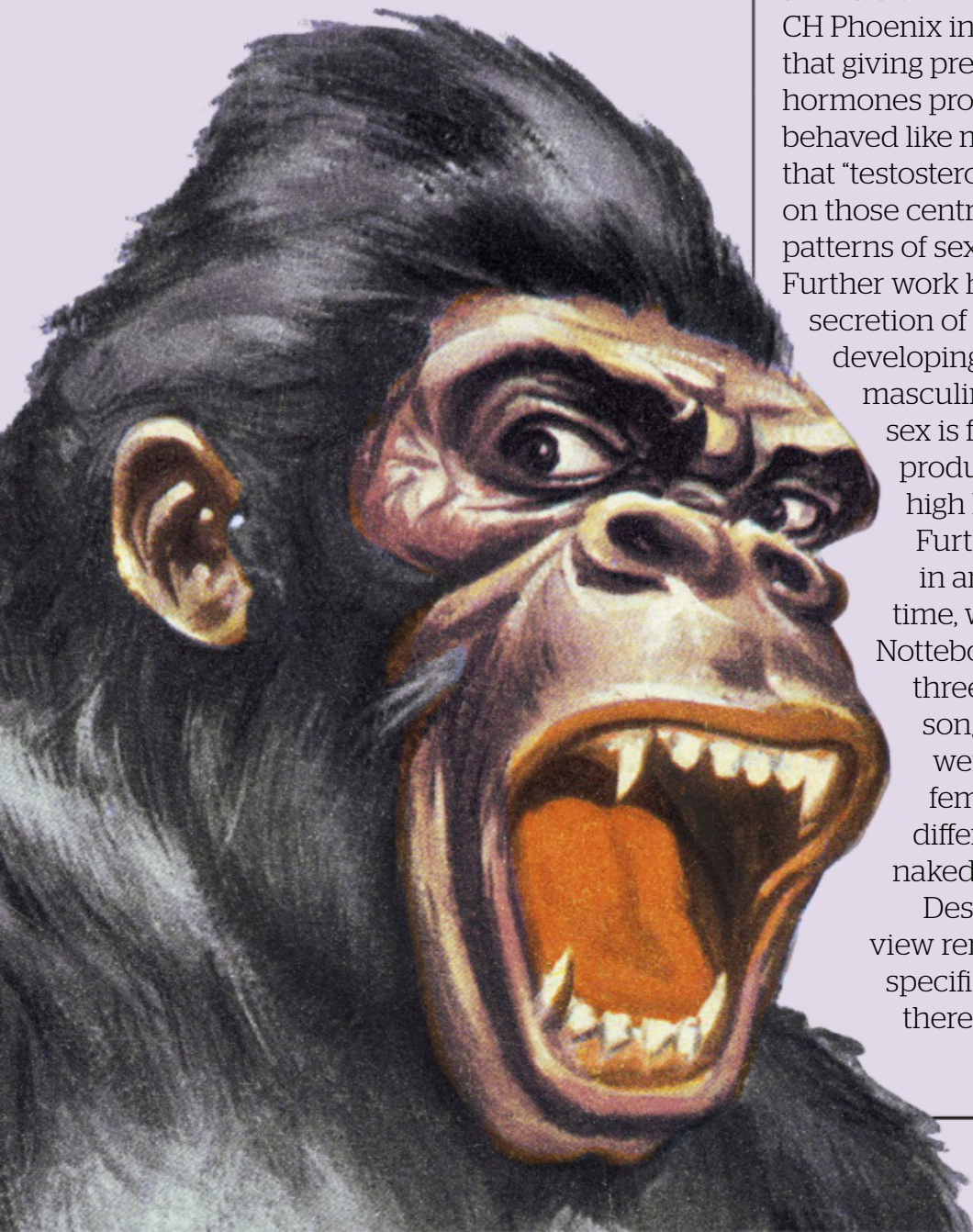
Despite these findings, the default view remained that, outside areas specifically to do with reproduction, there was no practical difference

between female and male brains in animals. One of the first neuroscientists to look for potential differences was Nirao Shah, who with his team identified specific genes that exhibited clearly different levels of activity between males and females in specific areas of mouse brains. Having identified these genes, they were then able to switch off a gene that was more active in female mice. The result was that the female mouse ceased defending her nest from intruders as well as no longer going after and bringing back to the nest any of her babies that had wandered off, although in all other respects she retained normal sexual behaviour.

But it's not only genes that control different aspects of behaviour in female and male mice: the sex hormones oestrogen and testosterone are vital too. A study by Melody Wu and Nirao Shah on genetically modified mice found that “oestrogen sets up the masculine repertoire of sexual and territorial behaviors and testosterone controls the extent of these male displays.”



Since those first experiments, there have been many more studies that have found differences in the brain structure between the sexes in animal species, from the sexually dimorphic nucleus in the hypothalamus, which is much larger in male mammals, through to the larger brain size of female carnivores that raise their offspring alone. But while we now know that animal, and in particular mammalian brains, have many examples of differences between the sexes that obviously cannot be explained as a result of gender stereotyping in the animal world, this does not necessarily mean that the same will be true in human beings. Although it would be strange, and requiring an explanation in its own right, if humans should be shown to be unique in this respect.



MIND THE TESTOSTERONE

© Simon Baron-Cohen



Testosterone levels appear to play a key role in the different development of male and female brains. Boy babies secrete higher levels of testosterone, from their testes, than do girls, with particular surges in production prenatally, between eight and 24 weeks, then at five months and again at puberty. Simon Baron-Cohen tested for levels of foetal testosterone by analysing the amniotic fluid preserved at Addenbrooke's Hospital from women who had had an amniocentesis during pregnancy. Checking the levels of pre-natal testosterone against tests for eye contact and vocabulary from the babies born to these women, he found that at 12 and 24 months, the levels of pre-natal testosterone were inversely related to eye contact and size of vocabulary. In other words, children with higher levels of pre-natal testosterone had smaller vocabularies and made less eye contact than those with lower levels of the hormone in the womb (note that girls are also exposed to testosterone, although they do not have testes, as the hormone is also produced by the adrenal gland).

Studying humans

The only way to know for sure was to look. At the start this was difficult - scientists can't simply look at human brains in the same way they can look at animal brains for the obvious reason that people object to having their heads opened up by a curious scientist. As a result, the first studies were rather crude comparisons of the volume of different brain areas from post-mortems. The problem with this, of course, was that the subjects, being a random selection of dead people, were not properly matched, a problem exacerbated with the younger subjects who, almost invariably, had not died from natural causes. However, while not very subtle, these studies did allow for the most basic of comparisons: the size of male and female brains. It turns out that male brains are, on average, heavier and larger than female brains. This remains true even when the results are corrected for men being overall larger and heavier than women. On average, men have four billion more neurones than women. More recently, a 2018 study by the UK Biobank looked at the data from 5,216 adults who had had MRI scans. The study found that, even after controlling for brain volume and overall size, men's brains had, on average a greater overall volume as well as greater volumes of white and grey matter. There were also differences

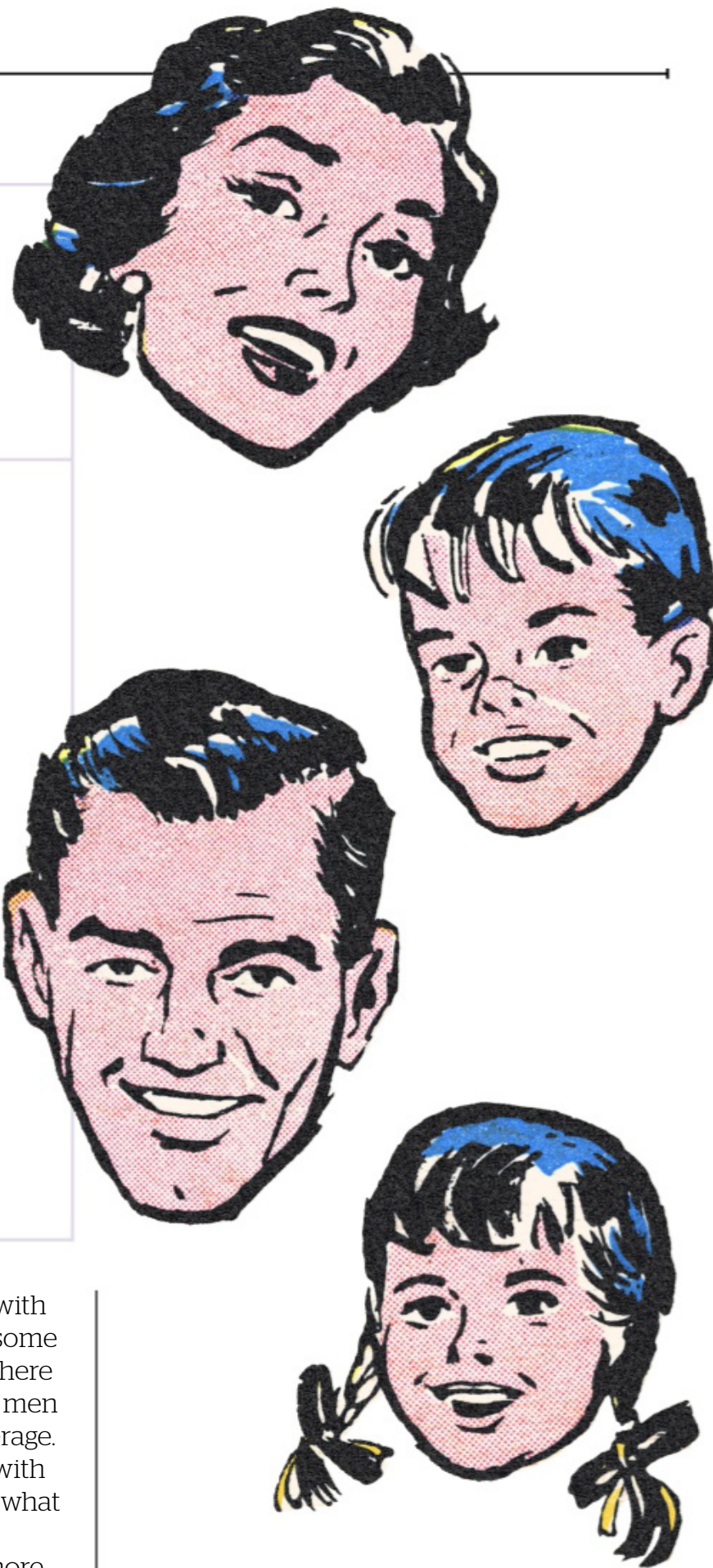
in the volume of particular brain areas, with women having larger brain volumes in some regions than men. It's important to note here that these findings in no way imply that men are more intelligent than women on average. Brain volume is very poorly correlated with intelligence - it's not what you've got, it's what you do with it that counts.


More specifically, these studies, and more sophisticated studies using brain imaging, did indicate that there were differences in the amount of grey matter between women and men. Grey matter, as differentiated from white matter, contains the cell bodies of neurones, synapses and capillaries, while white matter is chiefly the axon tracts that connect neurones. Men, on average, have greater volumes of grey matter in the amygdala, the hippocampus and the anterior parahippocampal gyri, among others. Women, on average, have more grey matter in the lateral occipital cortex, the right frontal pole, the inferior and middle frontal gyrus and the anterior cingulate gyrus, again among others. These differences in the volume of grey matter appear to be a function of differences in lateralisation between female and male brains. As is well known, the human brain is split into two cerebral hemispheres, the left and right, with the hemispheres controlling the opposite side of the body.

The best known result of this lateralisation is handedness, with Broca's and Wernicke's areas in the brain corresponding to which hand and foot a person favours: if the two areas are found in the left hemisphere then the person will most likely be right-handed.

In right-handers, language functions are concentrated in the left hemisphere for 90% of people, but for left-handers, the split is more even, with language production being bi-lateral or even in the right hemisphere for 50% of left-handers.

In more recent times, sophisticated research using diffusion tensor imaging, a form of magnetic resonance imaging (MRI), enables scientists to measure white matter and compare its location across males and females. The work found significant differences in the way female and male brains were wired (white matter being in large part the long axons that connect the neurones). It turns out that women's brains »





were significantly better connected across the different brain regions as well as between the two cerebral hemispheres, whereas the brains of men were better connected within brain regions. These findings confirm a general theme of research on sex differences in the brain: on average, men's brains are organised more asymmetrically than women's brains, while women have greater connectivity between the two hemispheres. Reviewing the experimental findings, Gaolang Gong stated that it is necessary "to take gender into account when designing experiments or interpreting results of brain connectivity/network."

Physiology and behaviour

But while it is now well established that there are differences in structure between male and female brains, these differences are small, with most features

shared between the sexes. It's worth stating this clearly before we go on to consider what, if any, the implications are of these findings. An obvious comparison is height. Men are, on average, taller than women, but the distribution is one of two overlapping bell curves, with most men and women lying within a common band. The same is true of differences in the brain: these are average differences and they tell us nothing about a specific individual. It is quite possible that the woman you are talking to might have a brain that is, structurally, more 'masculine' than average and vice versa, a particular man might have a 'feminine' brain. These are statistical differences, sometimes quite small statistical differences and, as such, subject to some controversy.

While there has been a lot of recent work to identify and study different brain structures in male and female brains, it has proved very difficult to demonstrate that differences in structures cause different behaviours. Indeed, quite the opposite, for here we hit, full square, the nature versus nurture conundrum. What has become abundantly clear is that any attempt to reduce human behaviour

WOMEN MATTER IN RESEARCH TOO

In 2009, the United States Food and Drug Administration did something unusual. It reduced the recommended dosage of Ambien, the most popular sleeping drug in America, by half. But it only did this for women. Ambien had been on the market for 20 years before this. We now know that men and women metabolise Ambien differently, which means that more of it is left in the system of women in the morning, leading to a greater risk of dangerous drowsiness the next morning when driving to work. Other drugs are also metabolised differently - even something as commonplace as aspirin. Low doses of aspirin help prevent heart attacks in men, but not in women, although aspirin does protect against strokes in women. This, potentially fatal, overdosing of Ambien in women was a result of the safety testing on the drug having been conducted on male animals. In response to the discovery that women and men respond to some drugs differently, the National Institute of Health issued new guidelines to everyone applying for research grants. Henceforth, to qualify for a grant, researchers would have to demonstrate that they are including sex as a biological variable in their research. No more just doing tests on male animals because they're easier and don't require the scientists to control for the female hormone cycle.

to a function of either nature – that is, our inherited disposition as a result of our genetic inheritance played out in different bodily and neurological structures – or nurture (the complex interplay between upbringing, experience and the wider culture) is hopelessly simple minded. Every individual is the result of a singular dance between their unique genetic inheritance and their equally unique experience of the world as mediated through a particular time, place and culture. While researchers have cautiously suggested a correlation between particular brain areas and particular behaviours, nothing further can be claimed at this stage of our knowledge.

All nature

However, if we cannot say with certainty that such and such a feature of gender-specific behaviour is caused by differences in the brains of men and women, can we look at the question from the other side? Can we demonstrate that there are differences in behaviour between men and women that are independent of culture and upbringing and are, therefore, innate? Let us take a closer look at the evidence.

The first step is to compare women and men over different areas of mental functioning and behaviour, with a preference given to studies on younger children who have had less time to be exposed to familial and societal influences. In a study that will come as no surprise to parents, Professor Melissa Hines of Cambridge University has shown that there are significant differences in the toys that girls and boys prefer to play with. Anecdotal evidence from many a parent of boys, finding their son transforming the most unlikely of objects into guns, swords and other lethal weapons bears this out. But Professor Hines went further, demonstrating that girls who had been exposed in utero to higher than normal levels of male sex hormones through a condition known as congenital adrenal hyperplasia also preferred typical boys' toys.

Among adults, there are robust cross-cultural differences in behaviour and interests between men and women. A particularly large study, involving half a million people, found that, on average, men have a greater interest in systems and women are more empathic. There are, of course, wide bands of overlap, but 40% of women as compared to 23.9% of men scored higher on empathising when compared to systemising, and 40.2% of men contrasted to 25.6% of women scored higher on systemising.

Perhaps the most striking gender differences are to be found in the varying vulnerabilities of men and women to mental health problems. Across cultures, women are more likely to suffer from depression than men, with one in four women needing

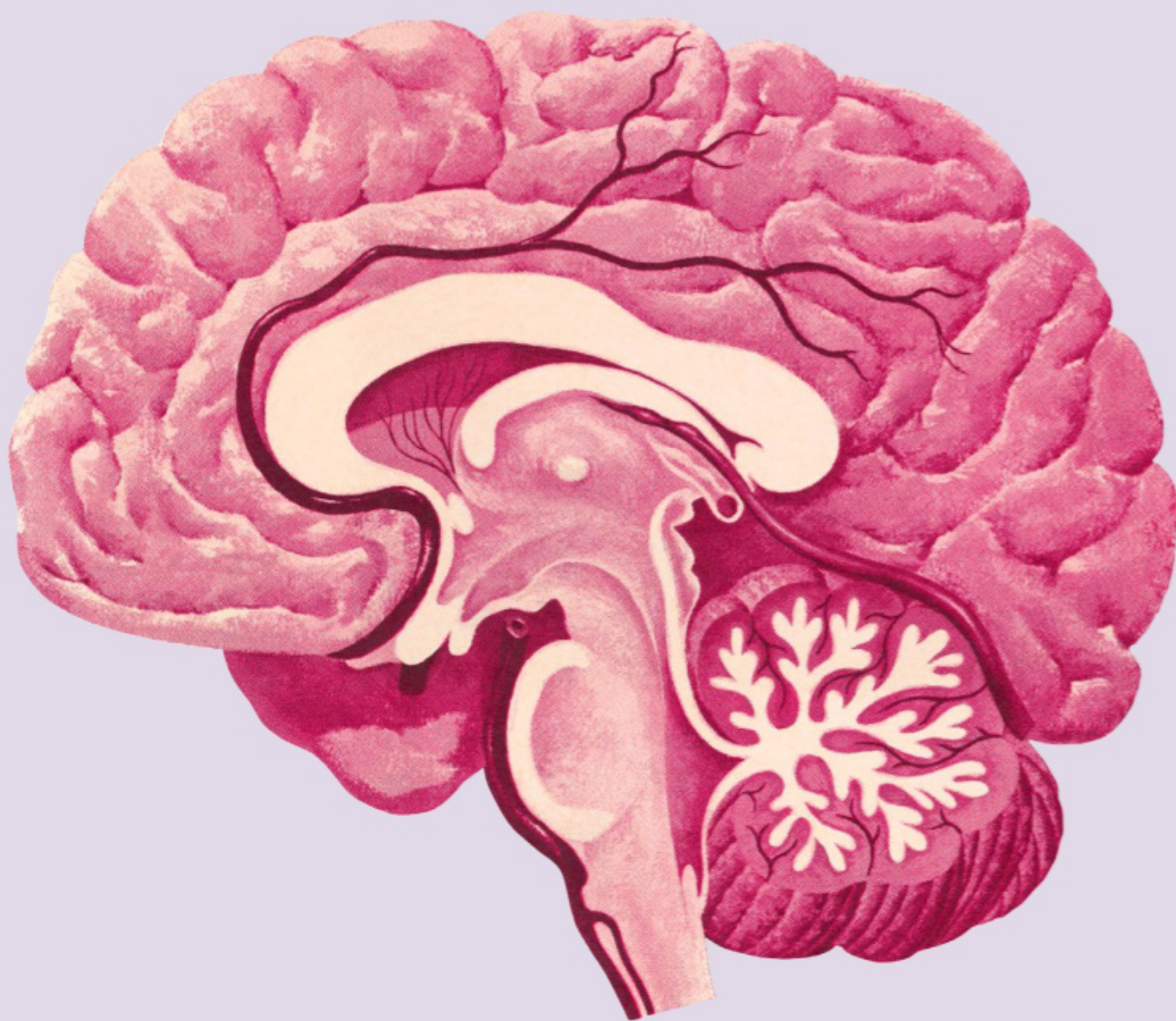
treatment at some point in life compared to one in ten men. They are also more likely to suffer from an anxiety disorder, and are hugely more vulnerable to eating disorders than men. Women are also more prone to dementia than men, with 65% of UK sufferers being women. As the single greatest risk factor in dementia is age, and women live longer, on average, than men, it would be expected that more women develop the disease than men. However, the numbers indicate that other factors, beyond women simply living longer and thus being more prone to the disease, are necessary to explain the discrepancy. Since women are also at greater risk of depression, and depression is itself a risk factor in dementia, this may be part of the reason for women's greater vulnerability to the disease. On the other hand, men are much more likely to be diagnosed as autistic, to become addicted to drugs or alcohol, and to commit suicide. In Britain, 80% of people dependent on alcohol are male, as well as 69% of those dependent on drugs. In Britain, suicide is the largest cause of death for men under 45, and worldwide, the suicide rate for men is much higher than that for women. Men also die by violence from other men much more often than women. Daly and Wilson analysed homicides through societies across the last 700 years and found that the rates of male-on-male murder were vastly higher than either men killing women or women killing each other. And while it is likely that women and girls with autism are underdiagnosed, what is clear is that, in the most extreme,

completely non-verbal cases of autism, where diagnosis is really not that difficult, boys are hugely over-represented.

Neuroscientists are only just beginning to work on the implications of these findings. According to Professor Cahill, "there are biologically based sex influences of all sizes on brain function all over the place, seemingly everywhere we look now that we are finally looking. These ubiquitous sex influences must have all manner of implications for understanding brain function and dysfunction (it is impossible that they don't). This is the reality that neuroscience is now finally grappling with."

Language and spatial skills

Differences in language and spatial abilities are also apparent from an early age. Girls begin to speak a month before boys on average and their vocabulary is larger. Their language superiority is not just restricted to speaking; they are better at reading and spelling too, as well as verbal memory. These differences are robustly cross cultural: women in America, Japan and South Africa were better at remembering the meaning of something they had read than men. On the other hand, men on average are better at spatial skills, in particular those that require rotating an object through three dimensions in the mind, with these differences also going back to early in life. A study by psychologists Scott Johnson and David Moore found a significant difference in this ability between male and female babies at only five months. Given that the children »



were only five months old, the question arises as to how they could test this. The researchers showed the babies pictures of a multi-coloured 3D 'L' shape, measured how long they looked at the picture before looking away, bored, then showed them the same shape again, but rotated, and then the mirror image of the shape. The baby boys looked significantly longer at the mirror image than the rotated same shape than the girls, which the researchers conclude was because they realised that the new shape was different from the previous two shapes they had seen, meaning that they were able to rotate the shapes in their mind.

These differences seem to be results of slightly different orientations between girls and boys: to wit, that girls are more people centred and boys more focused on systems and objects. Of course, there are cultural influences that will affect choice of interest. However, it is interesting to note that in the Scandinavian countries, where gender equality is most strongly entrenched in law and culture, there has been no corresponding change in careers and interests. Indeed, quite the opposite. Even in Sweden, Norway and Denmark, men still dominate in traditionally masculine occupations, while women, with every opportunity to follow careers in construction and the military, choose overwhelmingly not to do so. Is this the result of pernicious sexual stereotyping persisting even in the face of Nordic governmental disapproval, or does it have a basis in what we are as male and female? The only way to check is to see if there are significant gender differences between girls and boys before culture can start moulding them. The test on the five-month babies moves in that direction, but five months is still enough for a child to be moulded by his or her environment. What about babies that are a day old? They are as close to a tabula rasa as it is possible to get. If it is possible to find significant differences in interest between girls and boys at a day

“GIRLS BEGIN TO SPEAK A MONTH BEFORE BOYS ON AVERAGE AND THEIR VOCABULARY IS LARGER”

old, then we would be safe in concluding that these differences are, on average, hardwired into male and female brains.

So that is what two scientists did. Jennifer Connellan and Anna Ba'tki enlisted over 100 mothers and their new-born babies to take part in the study. The researchers wanted to see if there was a significant difference in the length of time these newborns looked at a face when compared to an object. The face was that of Connellan. The object was a ball, the same size as Connellan's face, with her face printed on it but with the features rearranged so completely that it no longer looked like a face. However, by using a picture of Connellan's face as the starting point for the ball, the researchers were able to ensure that the colour of both face and ball were the same, thus ensuring that any difference in response was not due to the babies having a particular interest in the colours presented to them. Finally, the mothers were asked not to tell the researchers the sex of their baby until after the baby was filmed to see how long it looked at face or ball. The results were then carefully analysed and, yes, the newborn boys, on average, looked longer at the ball and the newborn girls, on average, looked longer at the face.

Differences in the brain

This is not the only difference at birth that has been demonstrated. A 2018 study found that, at birth, the intracranial volume of boys (the space in the skull) is, on average, 6% larger than in girls, and that they have more cortical neurones. There were also differences in brain areas at birth, with those concerned with sensory processing being larger in boys while the area concerned with planning, self-control and cognitive flexibility was larger in newborn girls.

Studies on children this young, when combined with the evidence for sexual differentiation in the brains of male and female animals, provide ample grounds for supporting the idea, maintained by most neuroscientists, that the average differences in brain structures and attitudes that they find in men and women are a result of the interplay of biology and culture: not nature or nurture, but both, acting together.

Eric Prager, editor of the *Journal of Neuroscience Research*, sums up the current state of knowledge thus: "Sex matters not only at the macroscopic level, where male and female brains have been found to differ in size and connectivity, but at the microscopic level too." ■



“SCIENTISTS
THOUGHT MALE
AND FEMALE BRAINS
WERE BASICALLY
IDENTICAL”



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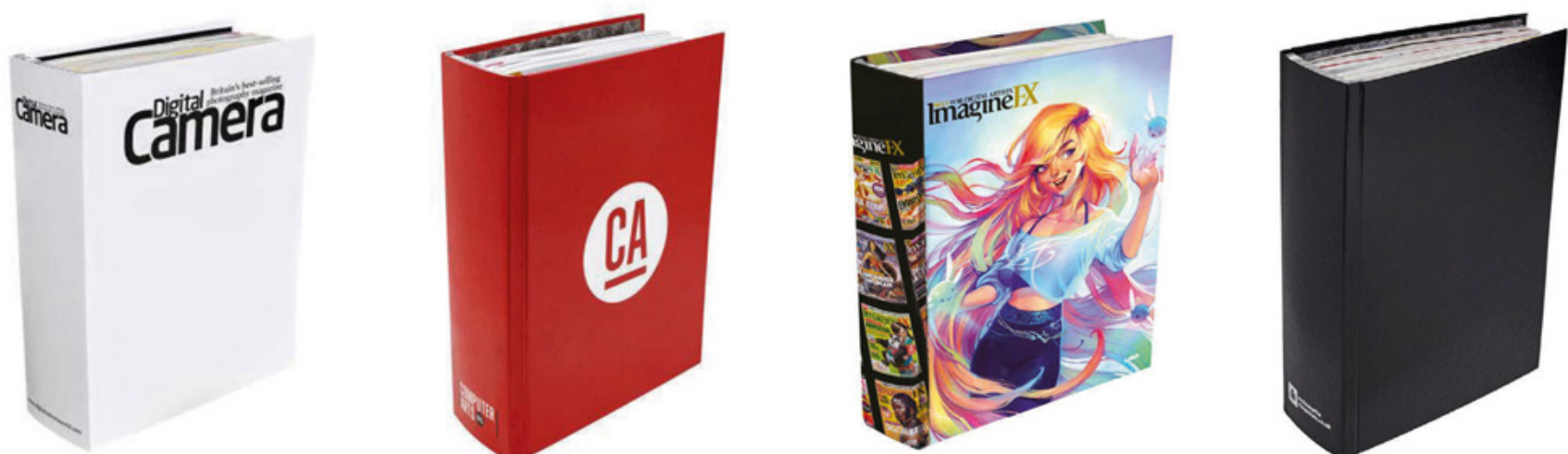
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Human nature is a fascinating concept. From the way we think to the way we behave, the mind is a powerful yet delicate tool, and must be nurtured in the same way we take care of our bodies. Gaining a greater understanding of human behaviour and mental processes will ultimately lead to a better understanding of ourselves. And once we realise why we and others behave in certain ways – whether alone or in group settings – it becomes much easier to avoid stressful situations, reduce anxiety, make better decisions, and live a more fulfilled life.

