

- Happiness

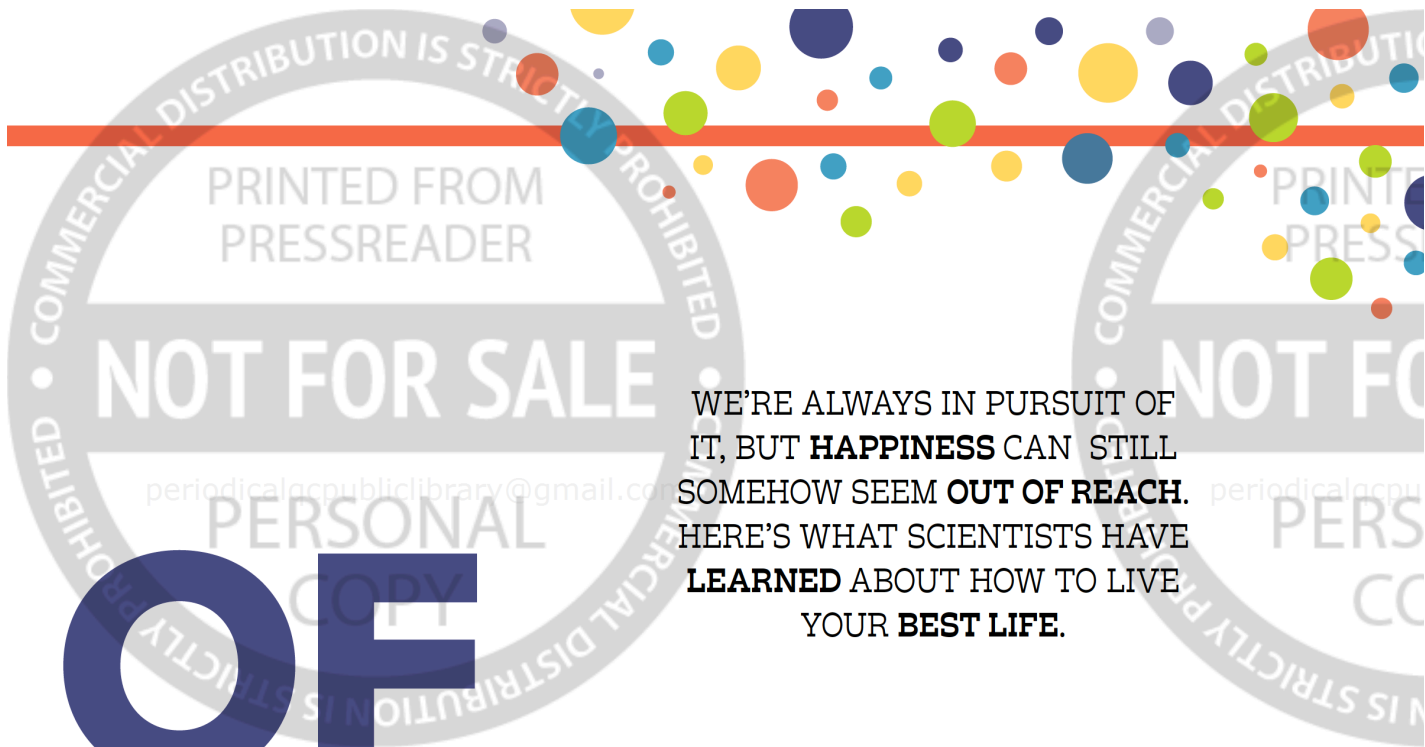
◆ SPECIAL SECTION ◆

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# THE SCIENCE HAPP





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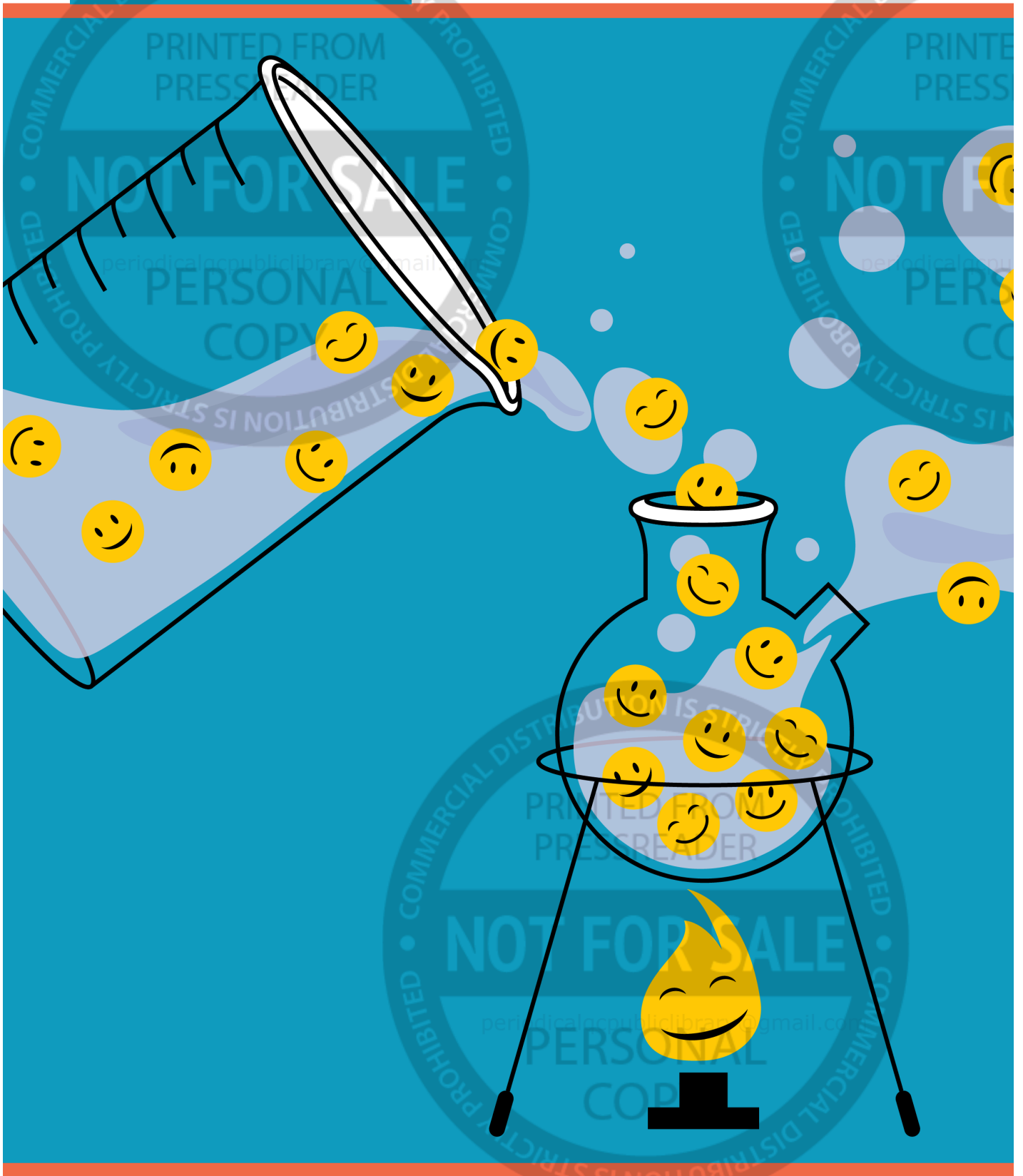
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WE'RE ALWAYS IN PURSUIT OF IT, BUT **HAPPINESS** CAN STILL SOMEHOW SEEM **OUT OF REACH**. HERE'S WHAT SCIENTISTS HAVE **LEARNED** ABOUT HOW TO LIVE YOUR **BEST LIFE**.

# OF INESS



RESEARCHING HAPPINESS



THE SCIENTIFIC STUDY OF HAPPINESS HAS NEVER BEEN TRENDIER. BUT WHAT DOES RESEARCH REALLY REVEAL ABOUT HOW TO STEER OUR MINDS TOWARD CONTENTMENT?

# THE WELL-BEING BOOM

BY ELIZABETH SVOBODA ■ Illustrations by Kellie Jaeger

◆ **Whether as self-help** touchstone or counterweight to post-COVID gloom, the science of happiness is having a cultural moment. Yale University psychologist Laurie Santos' "Science of Well-Being" course is the most popular the school has ever offered, enrolling more than 4 million additional online students. Meanwhile, *The New York Times* launched a week-long Happiness Challenge to kick off 2023, promoting seven research-backed exercises to boost well-being. And podcasts like *Ten Percent Happier* and *The Happiness Lab* promise science-fueled breakthroughs that can galvanize lasting mood changes.

Still, the deluge of research reports and self-help tips tends to obscure just how subjective happiness is, and how stubbornly it resists definition.

## RESEARCHING HAPPINESS

There's a wide spectrum between the sensory joy of gulping a milkshake and the state of deep flourishing Aristotle called *eudaimonia*. In the interest of consensus, many researchers now define happiness as "subjective well-being," which includes not just positive emotion but an overall sense of life satisfaction. That shared understanding has helped launch the field of well-being science — and there's good reason to believe insights from this field can boost our individual happiness when put into practice, says neuropsychologist Julia DiGangi, author of *Energy Rising: The Neuroscience of Leading With Emotional Power*.

"The part that's so powerful," DiGangi says, "is if you really give a concerted effort, the brain reaches a new set point." Boosting that set point, or baseline level of contentment, then, is far from a pipe dream.

**IN SCIENTIFIC TERMS**, happiness is all about neurotransmitters. When we're feeling content, these microscopic chemical messengers — including dopamine, which supplies temporary pleasure, and serotonin, which fuels longer-lasting well-being

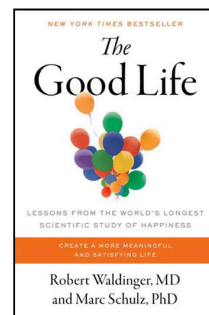
— flow into the brain and spinal cord. These happy hormones can impact almost every other bodily process, from mood and sleep regulation to blood flow. (Think about the way your face might flush, for instance, when someone compliments your outfit.)

Since our well-being is so anchored in our physiology, debates have flared over how much we can psychologically



control our own happiness. Most of us know people who stay effortlessly buoyant no matter what, while reductive headlines about the power of "happiness genes" imply you can inherit happiness the way you inherit a receding hairline or a knack for math. Yet the truth is more complicated: We actually have a surprising amount of latitude to shape our own well-being.

What gets in the way, though, is that our brains are hard-wired to focus on the negative, in part



**IN 2023**, the directors of the Harvard Study of Adult Development released *The Good Life* (Simon & Schuster), which recaps the decades-long study.

because doing so helps us evade disaster at key moments. (You wouldn't want to ignore that semitruck barreling toward you, for instance.) The budding science of positive neuroplasticity aims to offset this innate bias toward gloom, training people to focus more intently on triumphs and joyful moments.

When you do this, researchers say, you rewire your neural pathways to generate more joy and contentment, since the more

you pay attention to something, the more it tends to leave traces in the brain by strengthening existing neural connections and making new ones. "The brain is biased toward over-learning from painful, harmful experiences," says Rick Hanson, a psychologist at the University of California, Berkeley's Greater Good Science Center. "By tilting toward enjoyable, beneficial experiences, you're just leveling the playing field."

It's not enough just to pay attention

## THE EVOLUTIONARY ORIGINS OF HAPPINESS

It's easy to understand why emotions like fear promote survival: If we didn't bolt when a saber-toothed tiger jumped out, we'd be dinner. But happiness is more of an evolutionary conundrum. Does it help us thrive and reproduce? Or is it what biologists call a spandrel, a trait that did not arise to promote survival?

The debate continues, in part because it's hard to prove the adaptive value

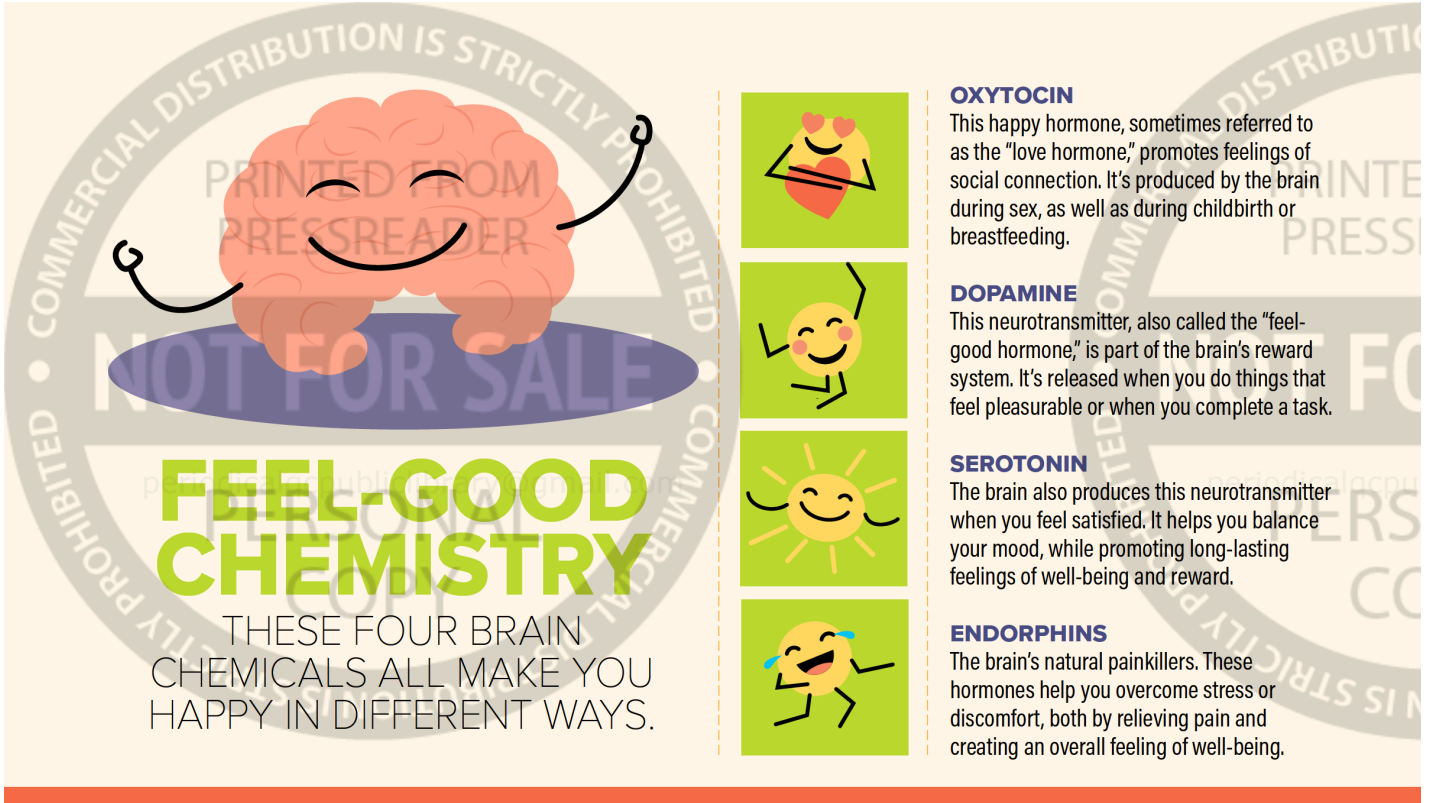


of certain traits in the lab. Some researchers think happiness persists because it makes us appear more attractive to others, which enhances our prospects of passing on our genes. (Since we know emotions can be contagious, people may also choose sunnier mates to boost their own

well-being.) And when we do things that ensure our survival, like holding down a job or moving up the social ladder, the happiness we feel may serve as a reward, encouraging us to keep doing those things. From an evolutionary standpoint, though, there are good reasons why







momentary happiness doesn't last. If we were steeped in contentment all the time, like spectators glued to an ever-looping movie, we'd be far less motivated to do what we need to do to survive. Endless delight might be seductive, but it can be deadly, too. —E.S.



**FEEL-GOOD CHEMISTRY**

THESE FOUR BRAIN CHEMICALS ALL MAKE YOU HAPPY IN DIFFERENT WAYS.

**OXYTOCIN**  
This happy hormone, sometimes referred to as the “love hormone,” promotes feelings of social connection. It’s produced by the brain during sex, as well as during childbirth or breastfeeding.

**DOPAMINE**  
This neurotransmitter, also called the “feel-good hormone,” is part of the brain’s reward system. It’s released when you do things that feel pleasurable or when you complete a task.

**SEROTONIN**  
The brain also produces this neurotransmitter when you feel satisfied. It helps you balance your mood, while promoting long-lasting feelings of well-being and reward.

**ENDORPHINS**  
The brain’s natural painkillers. These hormones help you overcome stress or discomfort, both by relieving pain and creating an overall feeling of well-being.

to good things that happen to you, Hanson says. You have to marinate in them. In practice, that means focusing your full attention on each positive moment for at least 20 seconds at a time, reflecting specifically on the experience and what you love about it. When Hanson’s students tried these techniques in his 18-hour course, they reported more positive emotions and more overall happiness.

**JUST AS IMPORTANT** as honing your inner focus is broadening your outer one — in other words, investing in strong connections with those close to you. The Harvard Study of Adult Development, which has followed more than 700 participants and their descendants for more than 85 years, has yielded one overarching finding: It’s not how smart you are, how many promotions you get or how much money you make that best predicts happiness. It’s the quality of your relationships with others.

“Our ethos of self-reliance is actually superficial and not quite true,” says Stephen Post, a Stony Brook University bioethicist and happiness researcher. “The deeper reality is our interdependence.” Yet

it’s all too easy to brush this reality off on a day-to-day basis. Because we’re not very good at predicting things like how much calling a friend will boost our mood, we tend to put off crucial opportunities to connect.

Forging those sustaining connections takes dogged, consistent investment. The thing about adult social relationships — as opposed to, say, college dorm ones, where you see your friends every day — is that they tend to wither unless both parties reach out to each other. Since social plans take a lot of mental overhead, it can help to choose meetups with a pre-set calendar, like a twice-weekly volunteer gig or a standing brunch the first weekend of the month.

Of course, that strategy won’t work unless you follow through on your scheduled commitment. One pitfall of our current happiness science obsession is that it’s so easy to assume you’re making headway by consuming podcasts and social media posts, and so hard to alter your life in ways that change your brain’s architecture for the better. Hoovering up online tips won’t raise your happiness set point. Only tweaking your thinking and habits will — and the dopamine boost you get after each small step may just entice you to keep going. **D**

*Elizabeth Svoboda is the author of What Makes a Hero? The Surprising Science of Selflessness.*

## → SCIENCE-BACKED SECRETS TO HAPPINESS

### PERFORM RANDOM ACTS OF KINDNESS

Yes, your kindergarten teacher was right all along. Plus, lending a hand to someone in need can actually benefit your own physical and mental health. Researchers at the University of Oxford found that participants who performed daily acts of kindness for a week — like helping a neighbor, paying for someone else’s movie ticket, or writing a thank you card — received a bump in happiness, according to a study published in 2018 in *The Journal of Social Psychology*.

## HAPPINESS &amp; TECHNOLOGY

## PRINTED FROM PROTECTING OUR MENTAL HEALTH WITH A.I.

WHEN DEPLOYED IN THE RIGHT WAY, ARTIFICIAL INTELLIGENCE HAS THE POTENTIAL TO SAFEGUARD OUR WELL-BEING, NOW AND IN THE FUTURE.

BY AVERY HURT ■ Illustrations by Kellie Jaeger

**Living a happy life** doesn't just mean adding the good stuff — it also requires avoiding the bad. Indeed, our subjective well-being is a reflection of positive emotions and our overall sense of life satisfaction; it's also the absence of negative emotions and mental health problems, such as anxiety and depression.

One billion people suffer from some kind of mental health disorder, according to a 2022 report from the World Health Organization. And the COVID-19 pandemic boosted the incidence of common mental health disorders such as anxiety and depression by 25 percent. In short, it's safe to say we need some help protecting our happiness.

Ironic as it seems, artificial intelligence may be able to help. AI gets a lot of grief for threatening our well-being, but many scientists are harnessing it to enhance our happiness. Because machine-learning algorithms can identify patterns that humans often miss, AI can sort through a wide variety of situational data, which can then be analyzed to deliver insights into a patient's mental health.

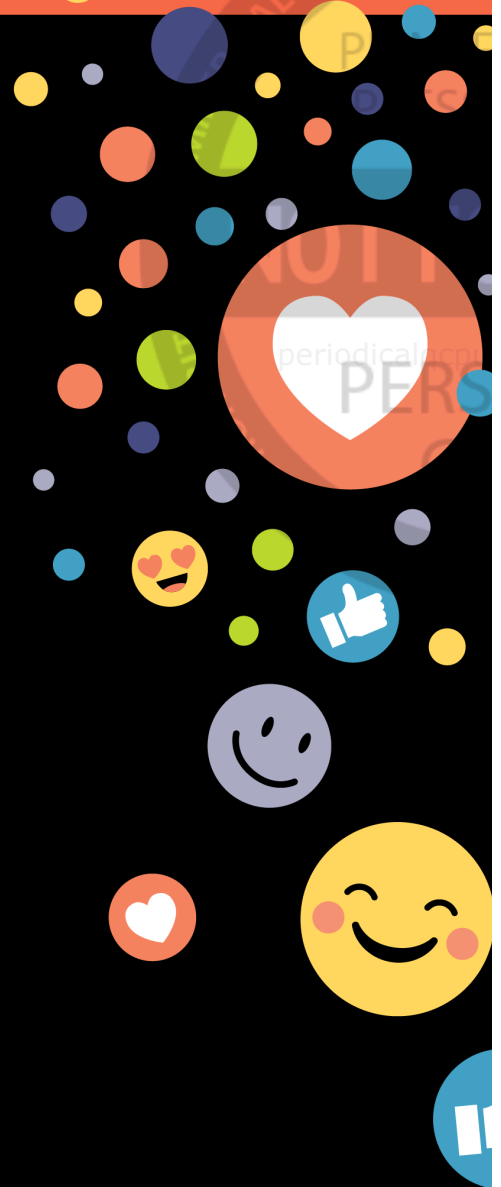
That's exactly what Harvard Medical School associate professor Paola Pedrelli and MIT director of affective computing research Rosalind Picard are doing, deploying wearables like Fitbits and Apple Watches and similar devices in the process. The scientists are using the tech to monitor patients' heart rates, temperatures, and even variations in the skin's electrical activity, which can illuminate their activity levels and quality of sleep. Then, they'll use that data to develop an algorithm that will detect the severity of an individual's depression.

"Unfortunately, many people with

depression feel better for a while, but then relapse, even when they're taking medication," says Pedrelli, also a clinical psychologist. And because symptoms of depression include low energy and lack of motivation, people often don't reach out for help, she adds. By noting changes in behaviors, like activity levels or sleep patterns, this technology could alert the patient, the physician, or both in time to intervene before the depression worsens.

Soon, AI may even be able to not only foretell future mental states, but also tell us what paths to take to ensure they're happy ones. Deep Longevity, a tech company focused on human health and longevity, created an ensemble of deep neural networks — trained with data from a psychological survey — that can predict the well-being of the respondents over 10 years. The findings tracked psychological patterns among the patients over time, showing, for example, that the ability to build meaningful relationships and mental autonomy increases with age.

A second model uses the survey data to identify the best path an individual can take toward mental stability, providing a personalized map toward optimal well-being. The research was published in 2022 in the journal *Aging*. The results suggest AI could be a potentially powerful tool for not just safeguarding our happiness, but enhancing it, too. ■





### 3 QUICK TIPS FOR STAYING HAPPIER ONLINE

**Want your** online life to boost your happiness rather than drain it? Then *you* need to take charge. Randi Smith, a psychology professor at Metropolitan State University of Denver who studies online engagement, has advice for doing exactly that:

#### WATCH THE CLOCK

Surfing the web can be like overeating, says Smith: It feels great while you're doing it, but afterward, you can have deep sense of regret. Don't overindulge. Set a timer and stop before you're full.

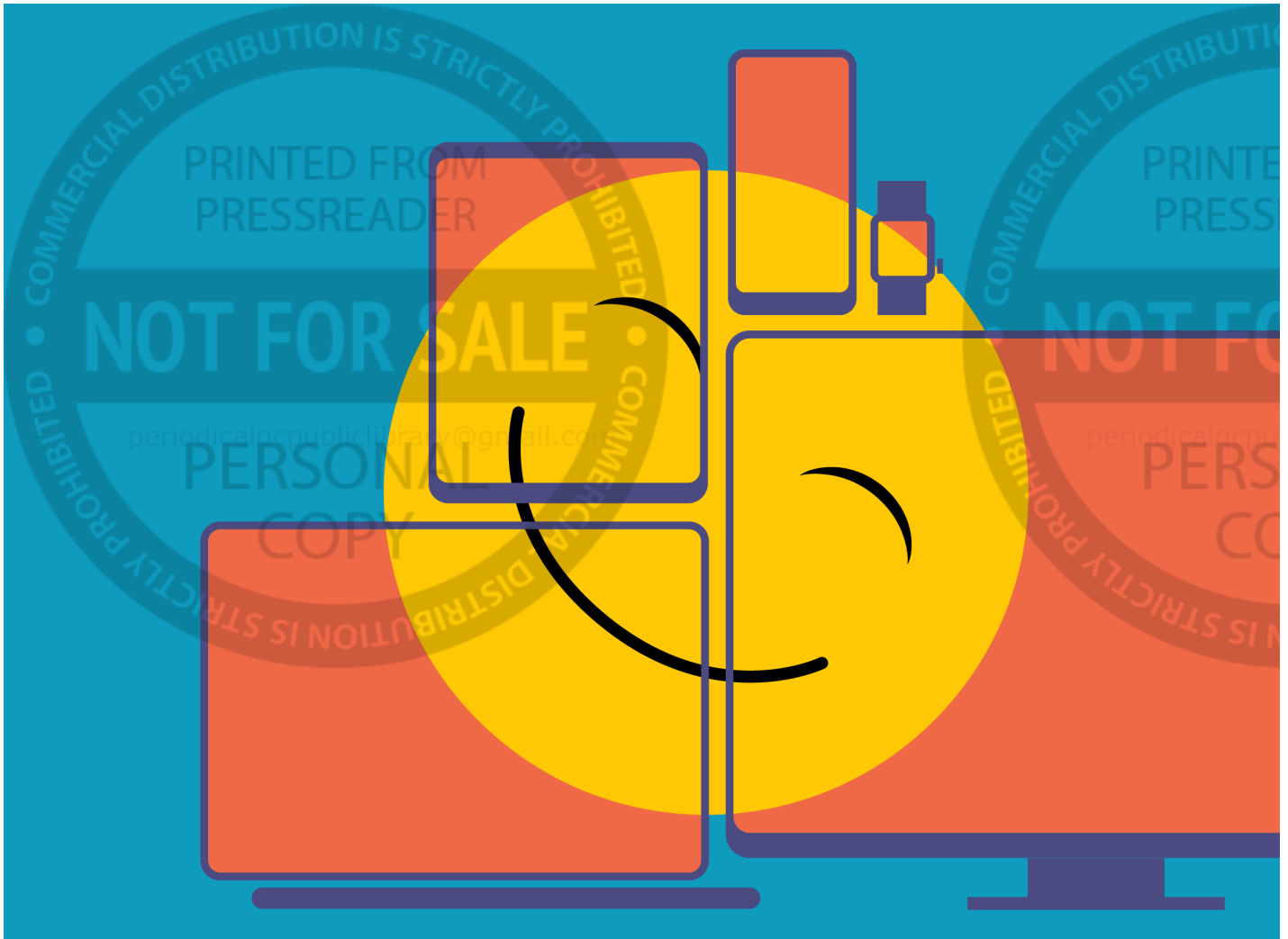
#### CONTACT CONTROL

Limit your contacts to people you know and care about. Following celebrities and influencers is unlikely to bring real meaning, Smith says, and can contribute to jealousy and lower self-esteem.

#### GO COLD TURKEY

A social media fast of at least 72 hours can make a huge difference in your happiness, says Smith. And when you come back, you'll likely have a clearer sense of how and with whom you want to spend your online time.

—A.H.



## FOR SOME, TECH IS A LIFELINE

FOR CERTAIN POPULATIONS, STAYING ONLINE AND EMBRACING EMERGING TECH CAN BRING MORE THAN JUST HAPPINESS.

- ◆ **Technology** — everything from social media and apps to video chats — doesn't do our well-being any favors. Or does it? While some studies have shown that too much online time can increase the risk of depression, others have found that the problem is overblown.

For example, a 2020 review found a dearth of studies that look at the effects of internet use over a long period of time, meaning there's still lots that we don't know about the potential harms of prolonged time scrolling social media. Plus,

there has been little research into any potentially positive effects of social media use, which suggests there may be benefits we've missed.

One thing is clear, however: Modern technology can enhance our social connections. And for some

people, that does more than boost happiness — it can be literally lifesaving.

### SOCIAL MEDIA CAN HELP LGBTQ+ YOUTH

One of the leading predictors of suicide in LGBTQ+ youth is feeling that you don't belong, says Shelley Craig, a professor of social work at the University of Toronto. When home and community don't provide that feeling, the internet can.

In research published in 2020, Craig and her team found that online, many transgender and gender-diverse youth could engage as their authentic selves and find a place where they felt a sense of belonging and kinship, often for the first time in their lives.

As a trans woman surveyed for the study said, "Internet social media has shown me I am not alone, [and] my struggle isn't something strange or unusual. It

◆ HAPPINESS & TECHNOLOGY ◆

→ SCIENCE-BACKED SECRETS TO HAPPINESS

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LOOK FOR DAILY EXPERIENCES OF AWE

A growing body of research suggests that experiencing awe can enhance our health and happiness. And you don't even have to shell out for a trip to Paris or the Grand Canyon to reap those rewards. Researchers found that participants who read a short, awe-inspiring story about seeing Paris from atop the Eiffel Tower felt greater life satisfaction in that moment than people who imagined themselves seeing a plain landscape from high up.

impacts of online fan communities — particularly those that focus on writing and reading fanfiction — has found that they can help writers process and receive feedback while fostering a strong sense of belonging.



These are just a few recent technologies that make it easier for people with disabilities to fully enjoy life. These devices can empower those individuals to better engage with their communities, excel in school and cultivate self-confidence — and find greater happiness in the process.

“Assistive technology levels the playing field, so people have agency to do what they want, to live their lives on an equal basis,” says Catherine Holloway, director of the World Health Organization Collaborating Center on Assistive Technology.

to aging. A 2018 survey by AARP found that 3 out of 4 people over age 50 want to stay in their homes as they age. Thankfully, modern tech can help. Setting medication reminders on a smartphone or checking in with family by text helps many older people remain independent.

Beyond that, researchers are now looking at ways to leverage artificial intelligence, addressing factors that influence physical safety and well-being. Sonia Chernova is lead principal investigator for the AI-CARING Institute, a National Science Foundation-funded institute focused on AI research, whose multicenter teams are developing sensors that alert a loved one when, say, the front door is left open or the stove is left on.

Researchers are also exploring the potential for AI to learn an individual's habits and patterns to better recognize when they need help, says Chernova. Remaining independent and being able to stay safely in our homes can keep the happiness in life, even as we age. —A.H.

THE BENEFITS OF ADAPTIVE TECH

There's the eye tracker that allows people with conditions such as paralysis, ALS, or cerebral palsy to control an iPad using only their eyes. Then there are the eyeglasses that convert audio input to text, to allow people with hearing impairments to converse with speakers in real time. There's even an app that translates the speech of people with nonstandard speech, such as those with muscular dystrophy or ALS.

HOW MODERN TECH AIDS AGING AT HOME

Home is where the happiness is, at least when it comes

has shown me people with my issues can become successful, and overcome [their] problems.”

This strong sense of virtual solidarity isn't just limited to LGBTQ+ communities, either. A growing body of research into the positive

→ SCIENCE-BACKED SECRETS TO HAPPINESS

2

SMILE MORE

Scientists Charles Darwin was one of the first to suggest that emotions could be altered by the facial muscles' activity — a concept known as the facial feedback hypothesis, which suggests the simple act of putting a smile on your face can boost your mood. In fact, a 2022 study that looked at nearly 4,000 participants across 19 countries found that even a forced smile could trigger — and amplify — feelings of happiness.

◆ THE PSYCHOLOGY OF HAPPINESS ◆

## POSITIVE PSYCHOLOGY 101

SCHOOL IS IN SESSION. HERE'S HOW TO CULTIVATE SKILLS FOR A HAPPIER LIFE.

BY SARA HARRISON ■ Illustrations by Kellie Jaeger

◆ **For a lucky 32 percent** or so of humans, happiness may seem like a matter of good genes. That's because their DNA encodes for certain personality traits, like extroversion and low anxiety, that are closely linked to increased levels of life satisfaction. In studies of twins, those genetic differences help

explain why one twin was happier with their life than the other.

But a happy life isn't entirely determined by genetics. For the most part, our happiness is impacted by environmental and behavioral factors, aspects of our lives over which we can exercise some control. And there are more direct ways to boost your happiness quotient, too. "Absolutely, you can teach people to be happier," says Sonja Lyubomirsky, a psychologist at the University of California, Riverside.

Often referred to as "positive psychology," a growing body of evidence suggests there are interventions

that can teach people happiness skills, like how to be more compassionate with themselves, or how to savor positive experiences. There are hundreds of possible interventions. Some emphasize reflecting on your personal strengths and values. Others involve meditation or connecting with others. Admittedly, none will yield euphoria — but they can make a meaningful difference in your life.

Lyubomirsky likens learning happiness to creating daily hygiene and exercise habits; a routine that has to be practiced frequently. One strategy she recommends is writing gratitude letters to



people in your life. "I know it sounds hokey," she says, but people who spend more time being thankful for what they have will be happier than people who dwell on all the things they lack.

There's no magic set of practices, though. That's why Lyubomirsky says it's important to find techniques that work for you. If a gratitude letter gets boring or isn't your thing, try calling a friend or meditating. Laurie Santos, a Yale University psychology professor who

teaches the wildly popular "Science of Well-Being" course, agrees. "Make sure that you're not just [phoning] these interventions in," she adds.

But neither genes nor clinically tested exercises can protect people from the reality that life is hard. During the pandemic, Santos found herself overworked, exhausted and perilously close to burnout. This year, she was fortunate enough to take a sabbatical and practice what she preaches. (She's spending more time connecting with friends and pursuing hobbies.) The experience has been an important reminder for Santos that even the most scientifically supported exercises can't help if you don't (or can't) do them.

"The strategies I teach work," she says. "But you have to make sure you're following them and putting them into practice, which takes regular work and effort." ■

### → SCIENCE-BACKED SECRETS TO HAPPINESS

# 4

#### PRACTICE GRATITUDE

It's no secret among scientists that giving thanks can alter your brain's neurochemistry, releasing the mood-boosting neurotransmitters serotonin and dopamine. Plus, regularly engaging in a gratitude practice, like journaling, can strengthen those neural pathways. Scientists studying psychological well-being among nurses found that those reporting higher levels of gratitude were more engaged at work, took fewer sick days, and had greater job satisfaction, according to a study published in the *International Journal of Workplace Health Management*.



## BANG FOR YOUR BUCK

MONEY CAN'T BUY HAPPINESS — BUT SPENDING IT THOUGHTFULLY CAN ENHANCE YOUR WELL-BEING IN UNEXPECTED WAYS.

**Researchers agree** we all need enough money to cover basic needs like housing and food, but there's little scientific consensus about how much money is enough to make humans happy. One 2010 study suggests an annual income of \$75,000 is the magic number (at least, it was at that time); after that, higher incomes didn't necessarily lead

to greater happiness among the participants. But other research finds no such cutoff point. Money may not be a path to absolute bliss, but it can certainly help — though not always in the ways we think. Here are a few research-supported suggestions on how to get the most happiness out of your spending:

### EXPERIENCES MAKE US HAPPIER THAN THINGS

A new dining room table might seem like a better (and more permanent) investment than a fleeting experience like a vacation, cooking class, or even a nice meal. But Cornell University psychology professor Tom Gilovich says that buying an experience will probably result in a bigger happiness bump.

For one thing, humans have a pesky habit of adapting to new situations. That's great for surviving after a major change like an amputation, or the loss

of a sense like sight or smell. But that adaptation is not so helpful if you're looking to boost your well-being. Humans will get used to that dining table, or the bigger house or the fancier car. But experiences remain novel — and connect us to other people.

Beyond that, our tendency to compare material objects is more pronounced than our tendency to compare experiences. It's easy to compare the size of a house or the price of an outfit, but experiences can be more personal. "You [build] your experience around you," says Gilovich, which means you get your own, unique memories to cherish and your own, special social connections to foster. And these experiences contribute to our overall sense of ourselves. "We are, in some meaningful sense, the sum total of our experiences," says Gilovich. "We aren't the sum total of our stuff."

### TIME IS WORTH THE MONEY

Don't want to clean your bathroom? Hate vacuuming out the car? If you can afford to buy your way out of the tasks you most dislike, you should. Buying back time allows people to indulge in tasks and activities that *do* bring them joy. And compared to other ways to spend money, buying time yields consistent emotional rewards, according to a study published in *PNAS* in 2017.

### SPEND ON OTHERS

Just like spending on experiences, "prosocial" spending — giving to charity or treating a friend to coffee — taps into our evolutionarily honed need to be connected. "It's one way in which we build and support our social relationships," says Lara Aknin, a social psychologist at Simon Fraser University in British Columbia. It might not be our first impulse, but spending on others triggers a positive feedback loop. "Giving to others makes us happy," Aknin says. "And the happier you are, the more likely you are to do it again." —S.H.



THE PSYCHOLOGY OF HAPPINESS

# HAPPINESS IS OTHER PEOPLE

A WEALTH OF RESEARCH SHOWS THAT HAPPINESS ISN'T SOMETHING WE CAN ATTAIN BY OURSELVES.

**Every morning** in graduate school, Gillian Sandstrom would wave to the woman selling hot dogs outside her building. "If she wasn't there on a given day, things didn't feel right. I missed her," says Sandstrom, now a psychology professor at the University of Sussex in the U.K.

"It was this huge source of comfort and security, and it was with someone I never talked to."

That connection satisfied a deep, bodily need for Sandstrom, just like water relieves thirst. Humans are intensely social creatures, and research increasingly suggests that losing our connections to others can negatively impact our health. A 2023 report by the U.S. surgeon general called widespread loneliness in the U.S. a deadly health risk comparable to smoking up to 15 cigarettes a day. By contrast, findings like those in the Harvard Study of Adult Development, which reported that close relationships were the best predictors of a long and happy life, are a testament to the importance of our close ties. What's more, the study also showed that octogenarians in happy marriages reported their happiness remained stable even on days when they were in greater physical pain.

But close relationships aren't the only social bonds that matter. Interactions of all kinds — chatting with a stranger, giving a smile of recognition to your local barista, or waving to the people you see every day at the dog park — create a much-needed sense of community. "We literally cannot survive or thrive without feeling like we are accepted," says Sandstrom.

These "weak tie" relationships aren't a substitute for the deeper, more meaningful connections we also need. But Sandstrom says we should recognize and celebrate their importance, and push ourselves to engage in them because they're so beneficial to



our sense of well-being. "I am an introvert," she says. "And, at the same time, I love talking to strangers. I believe that anyone can do it." —S.H.

## → SCIENCE-BACKED SECRETS TO HAPPINESS

# 5

### NURTURE YOUR RELATIONSHIPS

An ever-growing body of research shows that people with close-knit connections aren't just happier; they also live longer, are better protected against stress and depression, and even are less susceptible to inflammation and disease. A review on social support and longevity, published in *Frontiers in Psychology* in 2021, found "highly consistent evidence has accumulated over the past 60 years" that social support is linked with longer, healthier lives.

