10 New Discoveries

THAT MATTER TO YOUR HEALTH

Spirituality & Health

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A Strong Sense of Purpose May Protect Your Heart

IN JUST A FEW DECADES, our understanding of the mind and body has risen dramatically. Topics that were rarely talked about in the 90s — omega 3's, probiotics, and how the gut is intricately connected to the brain, for example — are now common knowledge for anyone interested in health. In fact, we now know that many debilitating mental health problems can be traced back to an unhealthy gut.

But just as an unhealthy body can lead to an unhealthy mind, unhealthy thought processes and emotions can lead to an unhealthy body. In fact, a new study shows that people with a strong sense of purpose in life have a 23 percent lower risk of death from all causes and a 19 percent reduced risk of having a stroke, heart attack or the need for coronary bypass surgery or cardiac stenting.

The findings, conducted by researchers at Mount Sinai St. Luke's and Mount Sinai Roosevelt, were just presented at the American Heart Association's EPI (Epidemiology and Prevention)/Lifestyle 2015 Scientific Sessions in Baltimore. According to the researchers, a "purpose in life" was defined as having a sense of meaning and direction and a feeling that life is worth living.

For the analysis, the researchers reviewed data on more than 137,000 individuals to determine the connection between having a life purpose and cardiovascular events or death. The findings were clear: those with a low sense of purpose were more likely to die or suffer cardiovascular problems.

"Developing and refining your sense of purpose could protect your heart health and potentially save your life," says lead study author Randy Cohen, MD. "Our study shows there is a strong relationship between having a sense of purpose in life and protection from dying or having a cardiovascular event. As part of our overall health, each of us needs to ask ourselves the critical question of 'do I have a sense of purpose in my life?' If not, you need to work toward the important goal of obtaining one for your overall well-being."

What brings you joy? What are your passions? What are your strengths? What breaks your heart? These are just a few of the questions for which your life's purpose could be the answer. But whatever it may be, your purpose should include an aspect of helping others in order to experience true fulfillment.

Wayne Dyer, in his book *There's a Spiritual Solution to Every Problem,* explains the idea of having a life purpose this way: "I suggest that you remember that the only thing you can do with your life is to give it away. In any moment when you are reaching outside your own self-indulgence and attempting to serve others, you are on purpose."

—TRACI PEDERSEN

Our Memory Capacity Is **Greater Than We Knew**

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SCIENTISTS HAVE DISCOVERED TEN TIMES MORE MEMORY CAPACITY IN THE HUMAN BRAIN.

WISH YOU HAD more storage space in your brain? Good news: you do! In fact, scientists have discovered 10 times more memory capacity. I wish I could tell you it's a boost from all the walnuts and salmon you've been eating, but this capacity has been there all along—it's just that new research has revealed it.

"Our new measurements of the brain's memory capacity increase conservative estimates by a factor of 10 to at least a petabyte, in the same ballpark as the World Wide Web," writes Terry Sejnowski, a professor at the Salk Institute in La Jolla, Calif. and co-senior author of the research, which was published in *eLife*. "This is a real bombshell in the field of neuroscience."

It helps to first understand how our memories and thoughts occur: They're a pattern of both electrical and chemical activity within the brain. A key part of the process is when branches of neurons, which are like electrical wires, interact with each other at junctions called synapses. The output "wire" (called an axon) from one neuron connects to the "input" wire (called a dendrite) of a second neuron. The electrical signal zooms across the junction, the synapse, as chemicals called neurotransmitters let the receiving neuron know what to do with the signal—where to send it next. Each neuron can have thousands of these synapses, connecting with thousands of other neurons.

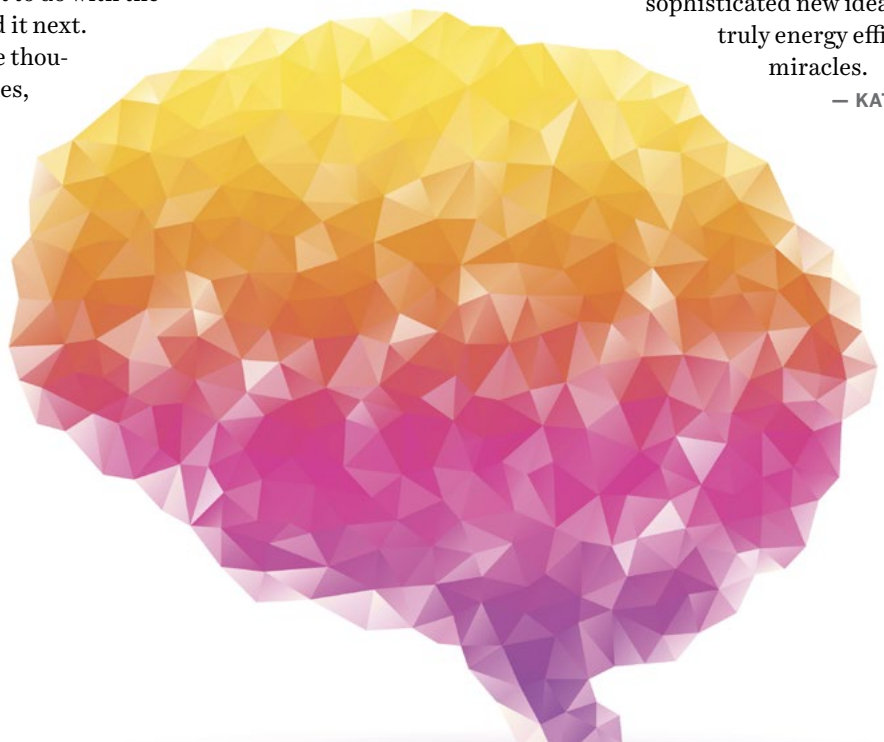
What the researchers figured out, using microscopy and computer algorithms, is that the size of the synapses ranged much more widely than was previously believed. Synapses used to be categorized as small, medium and large—like sweaters. "Our data suggests there are 10 times more discrete sizes of synapses than previously thought," wrote Tom Bartol, a Salk staff scientist. "In computer terms, 26 sizes of synapses correspond to about 4.7 'bits' of information. Previously, it was thought that the brain was capable of just one to two bits for short and long memory storage in the hippocampus."

Furthermore, the synapses constantly adjust themselves. Every two to 20 minutes, a synapse can go up or down a size according to what signals it is receiving.

"The implications of what we found are far-reaching," wrote Sejnowski. "Hidden under the apparent chaos and messiness of the brain is an underlying precision to the size and shapes of synapses that was hidden from us."

So next time you can't find your keys or blank on someone's name, be gentle on yourself. Think of all the amazing other things your brain IS doing and is getting right: the powers of electricity and chemicals that are being harnessed to created speech, to recognize objects, and to learn sophisticated new ideas. Our brains are truly energy efficient, flexible little miracles.

— KATHRYN DRURY WAGNER



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The Surprising Connection Between Sitting and Anxiety

Understanding the link between sedentary behavior and anxiety can help us come up with strategies for lifestyle changes.

JAMES BROWN WAS on to something when he told us to "Get on up!" We've known that sedentary behavior is linked to health problems like obesity, diabetes, heart disease and osteoporosis. New research, published in the journal *BMC Public Health*, shows that there is also a link between sedentary behavior and anxiety.

Anxiety disorders affect about 3.3 million American adults each year, according to the Anxiety Disorders Association. These include general anxiety, panic disorder, social anxiety, phobias, obsessive-compulsive disorder, PTSD and other related mental health issues. People suffering from anxiety often experience a never-ending sense of worry, but they also have physical symptoms, such as rapid heartbeat, headaches, stomachaches, muscle tension, and even difficulty breathing.

The new study was an analysis conducted by researchers at the Deakin University Centre for Physical Activity and Nutrition Research in Australia. They looked at nine other studies, looking for an association between anxiety and sedentary behavior—things such as watching TV, sitting at work, or riding the bus during a commute. In five of the nine studies, an increase in sedentary behavior was associated with a greater risk of anxiety, and in four of the studies, the total sitting time was the key thing associated with that greater risk. Screen time was less strongly connected with anxiety, though one of the studies did link more than 2 hours of screen time to a greater likelihood of anxiety than if someone spent less than 2 hours.

"It is important that we understand the behavioral factors that may be linked to anxiety—in order to be able to develop evidence-based strategies in preventing/managing this illness," wrote lead researcher Megan Teychenne. Researchers aren't exactly sure how sedentary behavior could cause anxiety, but suggest it could come from several ways: by disturbing sleep patterns, causing changes in metabolism, or from social withdrawal. Social withdrawal theory suggests that being glued to "Orange Is the New Black" or Instagram can lead people to spend less time on their interpersonal relationships, leading to increased anxiety.

Whatever the root cause, understanding that there is a link between sedentary behavior and anxiety can help us develop lifestyle changes and come up with smart strategies for daily living.

— KATHRYN DRURY WAGNER

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Feelings of Awe Lower Inflammation

DO YOU KNOW a person who still seems to retain a childlike sense of wonder well into adulthood? Someone who still dances in the rain, has a strong imagination, and is awe-stricken by the beauty of the world? New research shows that people who experience frequent feelings of awe and who immerse themselves in the beauty of nature, art and spirituality tend to have lower levels of pro-inflammatory cytokines.

Cytokines are proteins that signal the immune system to work harder. They are vital in that they help us fight off infections, trauma, and viruses; however, an overproduction of them leads to chronic inflammation, which in turn contributes to a variety of negative health outcomes, such as heart disease, type 2 diabetes and many mental health disorders.

The good news is that we have more control over our health than previously thought. Research is mounting that good health stems not only from our diet and exercise habits, but also from our emotions and state of mind. In fact, researchers from the University of California, Berkeley just found that feelings of awe are linked to a powerful anti-inflammatory action in the body. Good feelings, in other words, are like the emotional version of fish oil supplements.

"That awe, wonder and beauty promote healthier levels of cytokines suggests that the things we do to experience these emotions – a walk in nature, losing oneself in music, beholding art – has a direct influence upon health and life expectancy," said co-author Dacher Keltner, a psychologist at the UC, Berkeley, in a press release.

For the study, more than 200 young adults reported the extent to which they had experienced positive emotions on a particular day, such as amusement, awe, compassion, contentment, joy, love and pride. On the same day, researchers took samples of the participants' gum and cheek tissue, known as oral mucosal transudate. Those who experienced more positive emotions, particularly awe, wonder and amazement, had the lowest levels of the cytokine Interleukin 6, a marker of inflammation.

The researchers can't say for sure which comes first – the low cytokines or the positive feelings: "It is possible that having lower cytokines makes people feel more positive emotions, or that the relationship is bidirectional," said lead author Jennifer Stellar, a postdoctoral researcher at the University of Toronto. But whichever direction it flows, the link between the two is significant.

Make awe a daily habit in your life by taking the time to really look at the awesome beauty of the world in which we live. For starters, pick a song, a work of art, or even an old tree that you have seen many times, and experience it with new eyes, as if you are seeing (or hearing) it for the first time. As you make this practice a part of your daily life, witness your sense of wonder increase and your levels of inflammation go down.

The UC, Berkeley study is published in the journal *Emotion*.

—TRACI PEDERSEN

Aging: One Size Does Not Fit All

A NEW STUDY SUGGESTS DIFFERENT MEASURES FOR DEFINING "OLD AGE."

THERESA IS 65 YEARS OLD. She has a plot in her community organic garden, hosts sleepovers for her granddaughter and has been known to dip into the world of Internet dating. She's still working a few days a week as a freelance book editor. Mona, also 65, uses a walker and just had an arthritic shoulder replaced. She's fully retired, on multiple prescriptions and prefers to watch TV or read. These women are the same chronological age, but their differing physical and social experiences highlight the problem in using just one number to define people.

In many countries around the world, age 65 is used as an arbitrary cutoff as "old age," the number used to determine things like pension age and for access to health care systems. It's also how statisticians determine a demographic measurement called "old-age dependency ratio," which assumes everyone over 65 is depending on everyone between the ages of 20 and 65.

A new study in the journal *Population and Development Review* suggests that defining people as "old" at age 65 no longer fits our modern era, with many of us living longer, healthier lives. The new study pulls together a collection of demographic methods that replace the old-age dependency ratio for a variety of purposes, which should provide more useful information for policymakers.

"There are better measures available for every aspect of population aging to which it is applied," wrote study author Warren Sanderson, of the International Institute for Applied Systems Analysis. "Aging is a suite of multidimensional phenomena. In this study we deal with a number of aspects of aging and show that better measures exist for all of them [than the number 65]."

The study proposes, for example, a health-care specific calculation that takes into account how much later people are dying because of the increase in life expectancy. Older projections of health care costs use age 65 as the cutoff, massively overestimating the future costs of a health care system. The study also included a proposal for new pension payout structures, to make things more equitable across all generations.

These new approaches to measuring how a population ages can help us more accurately plan for 21st century conditions.

— KATHRYN DRURY WAGNER

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A Bad Night's Sleep Is As Dangerous As a Poor Diet

SO YOU STAYED UP TOO LATE binge-watching "Scandal," or burning the midnight oil on an important work project—what's one night of lost sleep, anyway. Actually, scrimping on as little as one measly night's sleep can have a profound effect on our metabolism, researchers have found.

A new study, presented at the Obesity Society Annual Meeting last week, found that one night of sleep deprivation and six months consuming a high-fat diet both impaired the body's insulin sensitivity to nearly the same degree. Insulin resistance is important, because if the body starts to become resistant, has to pump out more and more insulin in order to keep blood sugar levels stable. That can lead to Type 2 diabetes. Obesity itself is also associated with insulin resistance, and later, diabetes.

The study was conducted in canines. First, the dogs' levels of insulin sensitivity were measured after one night of sleep deprivation. (How you deprive a dog of sleep, I don't know. Perhaps a lot of cats were involved?) Next, the dogs were fed a high-fat diet for six months, and their insulin sensitivity was again tested. Surprisingly, one night of sleep deprivation reduced insulin sensitivity by 33 percent, more than the six months' of a high fat diet, at 21 percent.

"Research has shown that sleep deficiency and a high-fat diet both lead to impaired insulin sensitivity, but it was previously unknown is which leads to more severe insulin resistance," wrote study author Josiane Broussard, Ph.D. She is a project scientist at the Diabetes and Obesity Research Institute at Cedars-Sinai in Los Angeles. "Our study suggests that one night of total sleep deprivation may be as detrimental to insulin sensitivity as six months on a high-fat diet. This research demonstrates the importance of adequate sleep in maintaining blood sugar levels and reducing risk for metabolic diseases like obesity and diabetes."

The takeaway for health practitioners, the study goes on to say, is that they need to emphasize with patients the importance of getting a good night's sleep each night, whenever humanly possible. Obviously, there's going to be times of jetlag or a newborn baby when a solid night's sleep is... well, but a dream.

In addition to the insulin issue, a lack of sleep can also lead to a person making poor food choices the next day, and leave us with little energy to go exercise. It's a vicious cycle, making sleep all the more essential. So our pillows are powerful tools in our wellness arsenal.

— KATHRYN DRURY WAGNER

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Your Father's Stress Affects Your Health

A new study sheds more light on how something besides DNA plays a role in our health inheritance.

LONG BEFORE YOU WERE BORN, the foods your father and grandfather ate, the drugs they took, even the stress they felt—it all started to affect your health, and stranger still, will affect the health of your children.

This idea comes from the field of epigenetics, a fast-growing segment in the world of genetic research. Epigenetics refers to how chemical reactions caused by external or environmental factors, can activate or deactivate genes, almost like a dimmer switch. "Most of us were taught that our traits are hard-coded in the DNA that passes from parent to offspring. Emerging information about epigenetics may lead us to a new understanding of just what inheritance is," reports the University of Utah Health Sciences. Researchers are finding that epigenetic change can be influenced by things like aging and lifestyle, and are looking at how it can result in diseases such as cancers, coronary heart disease and immune disorders.

A new paper just published in *Science* sheds more light on how something besides DNA plays a role in our health inheritance. Researchers at McGill University looked at proteins called histones, part of the content of sperm that is used during fertilization, and how these guide embryo development. Using mice as subjects, they slightly tweaked the biochemical information on the histones, and studied the effects on the offspring. This "nick" in the histones had major consequences, with the mice offspring born with birth defects, abnormal skeletons and lower rates of survival. More surprisingly, two generations later, these effects could still be seen.

"When we saw the decreased survivability across generations and the developmental abnormalities, we were really blown away as it was never thought that altering something outside the DNA could be involved in inheritance," wrote Sarah Kimmins, from McGill's Dept. of Animal Science, and one of the lead authors on the paper. "These findings are remarkable because they indicate that information other than DNA is involved in heritability. The study highlights the critical role that fathers play in the health of their children and even grandchildren."

Because changes on the histones are susceptible to environmental exposures, such as stress, diet and chemicals, this discovery will mean new ways of investigating the prevention and treatment of many diseases, across multiple generations.

— KATHRYN DRURY WAGNER

Loneliness Makes You Sick

A NEW STUDY SHEDS LIGHT ON WHY BEING LONELY IS SUCH A MAJOR HEALTH RISK.

ONE IS THE loneliest number, and it may be the sickest number, as well. A new study from a team of researchers, including UChicago psychologist and leading loneliness expert John Cacioppo, sheds light on why being lonely is such a major health risk.

Previous research from Cacioppo and UChicago showed that feeling lonely can up an older person's chances of premature death by 14 percent. But the biological reasons why haven't been well understood. This study looked at adults aged 50 to 68, as well as a species of monkey called rhesus macaques, which are known for being particularly sociable. Researchers looked at gene expression in leukocytes, cells in the immune system that help protect our bodies against bacteria and viruses. In both lonely humans and lonely macaques, there was decreased expression of genes involved in antiviral response. Interestingly, this gene expression and loneliness seem reciprocal: the gene expression could predict loneliness measured a year or so later.

Loneliness also triggered higher levels of the "fight or flight" neurotransmitter, norepinephrine. This stimulates blood stem cells in bone marrow, up-regulating the body's inflammation response. So loneliness was causing more inflammation and less viral protection, causing less optimal health conditions.

According to Cacioppo's 2014 work on the health risks of loneliness, symptoms can include interrupted sleep, depression, higher levels of the stress hormone cortisol, and increased blood pressure. He says it isn't actual isolation that causes health risks—some people are completely fine with solitude—but a profound *sensation* of being alone that causes negative effects. His research suggests three important areas where we can foster healthy relationships as we age:

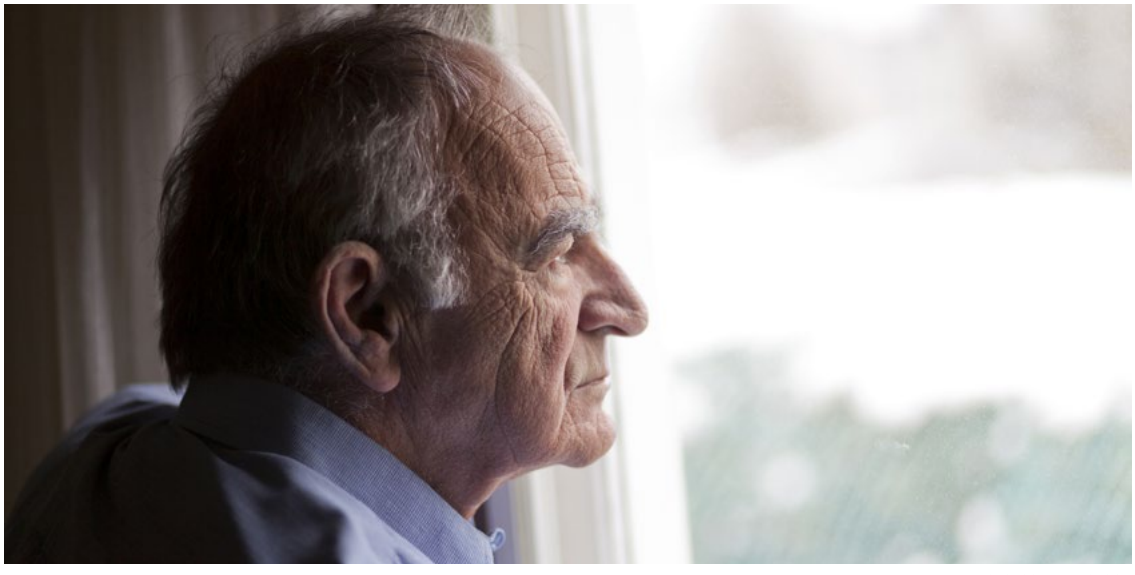
Intimate connectedness, which comes from have people in your life who affirm who you are.

Relational connectedness, which means having face-to-face interactions that feel mutually rewarding.

Collective connectedness, or a feeling that you are part of something that is bigger than yourself, something beyond your individual existence.

These three types of connectedness help older adults become more resilient, less depressed and have higher subjective well-being.

"Retiring to Florida to live in a warmer climate among strangers isn't necessarily a good idea if it means you are disconnected from the people who mean the most to you," wrote Cacioppo in his study. Population changes make understanding the role of loneliness and health all the more important, he explained. — KATHRYN DRURY WAGNER



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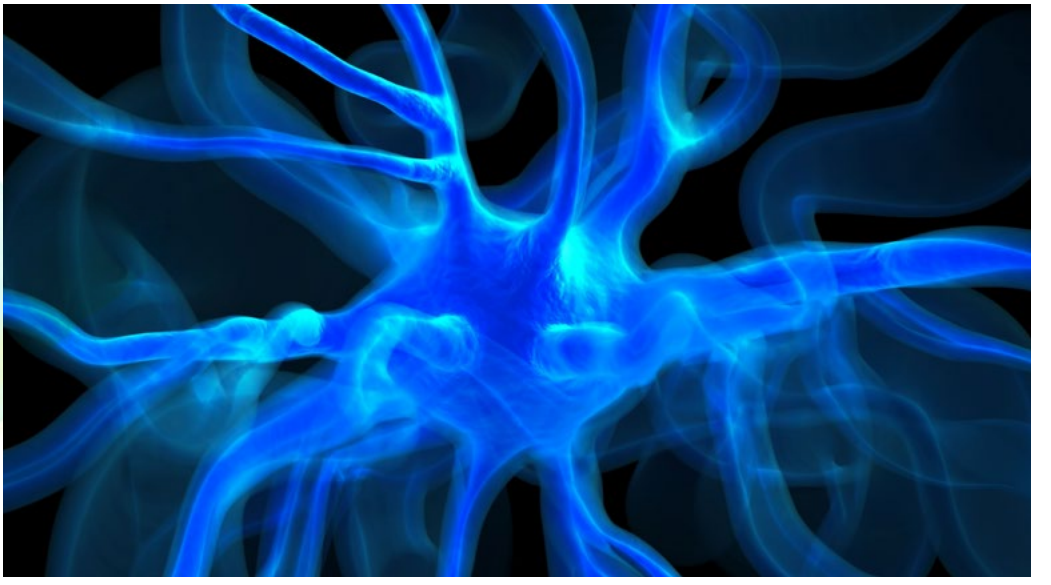

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Fertilizer for Your Brain

WE KNOW THAT one way to keep our brains healthy and limber as we age is to learn something new. We can take up tango dancing or the subtle intricacies of making chocolate souffle, but the process of learning does not get easier as we get older. Our brains simply are not as malleable and they were when we were, say, 5 years old. Exciting science is emerging that shows how we can create an environment ripe for learning, in our own brains.

Until the final years of last century, the thought among scientists was that at a certain point in our lives, our brains stopped growing. Common thought was that we were born with a certain amount of neurons (brain cells) and that was it for us. However, this thinking was turned upside down in 1998 when a study was published in Nature Medicine that showed under certain conditions, parts of our brain can create new connections, grow new neurons, and repair itself.

One of these conditions is exercise, aerobic exercise in particular. The most exciting substance that has been found in relation to brain growth is called BDNF (brain derived neurotrophic factor). Essentially, it hangs out in the spaces between the neurons, and is released en masse when we jack up our heart rate. John Ratey, a professor of Psychiatry at Harvard medical school calls BDNF 'miracle gro for the brain' due to it's ability to 'fertilize', initiate, and amplify connections in the brain.

Increased neural connections in the brain is what happens when we learn something new. When these connections are amplified in our brain, what we are learning starts to feel easier, less like work, and more fun and familiar; we don't have to think about it as much because those connections are already formed.

Recently, studies have looked at what type of exercise most effectively raises BDNF. A study in the *Journal of Sports Science and Medicine* showed that the most effective way to increase base levels of BDNF is high intensity aerobic exercise. Moderate exercise can temporarily increase levels, especially if done over a longer period of time, (specifically, walking 30 minutes per day for 5 weeks), but it's the shorter, more intense exercise sessions that show the most benefit in getting those levels up for the long term. Increasing baseline levels is what we want, because having to rely on taking a 30 minute walk immediately prior to any type of learning challenge is not the most convenient idea.

So, how we do make higher intensity exercise safe for the aging body?

Check with your doctor. Higher intensity training challenges all your muscles, including your heart. Be sure your doctor gives you the go-ahead to push yourself a little harder.

Warm up. To decrease your chances of injury, start with a warm up, something similar to what you will be doing during your workout. This gives your body a chance to get more blood moving to your muscles, it can also get your joints moving, and facilitate your range of motion.

Increase speed or intensity. When biking, pedal faster or turn up the dial. If you're walking, try jogging, or find a hill to hike up. Do one or the other to increase the intensity of your workout. Slowly increase your capacity and you'll get the benefits without hurting yourself.

Keeping your body and your brain active and engaged will raise the quality of your life throughout the years. When one activity can help achieve both goals, it's worth a try.

—KALIA KELMENSON

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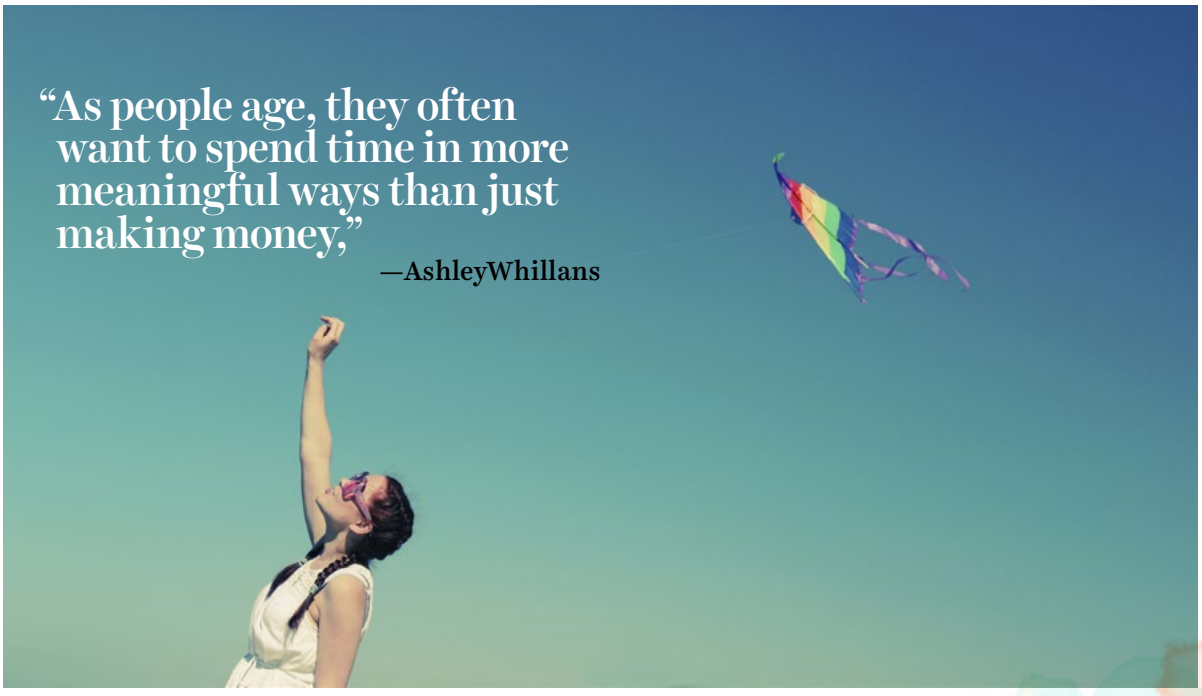

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Want to Feel Happier? Value Your Time

WORK LESS AND BE HAPPIER.

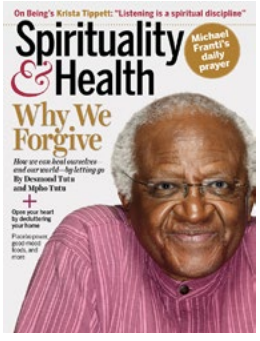
WANT THE SECRET to greater happiness? Value your time, rather than constantly striving to make more money. At least that is suggestion coming from research recently published in the journal *Social Psychological and Personality Science*.

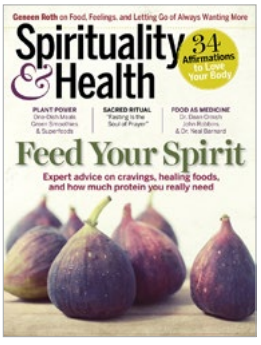
The research looked at six studies involving 4,600 participants, with a representative sample of Americans and Canadians. Some of the studies asked participants whether they put greater valued on time or money by using real-world examples, such as whether he or she would prefer a more expensive apartment with a short commute or a less expensive apartment with a longer commute. Or, participants were asked a question such as "would you choose a graduate program that would lead to a job with long hours and a higher starting salary, or a program that would result in a job with a lower salary but a job that meant you had to work less hours?"

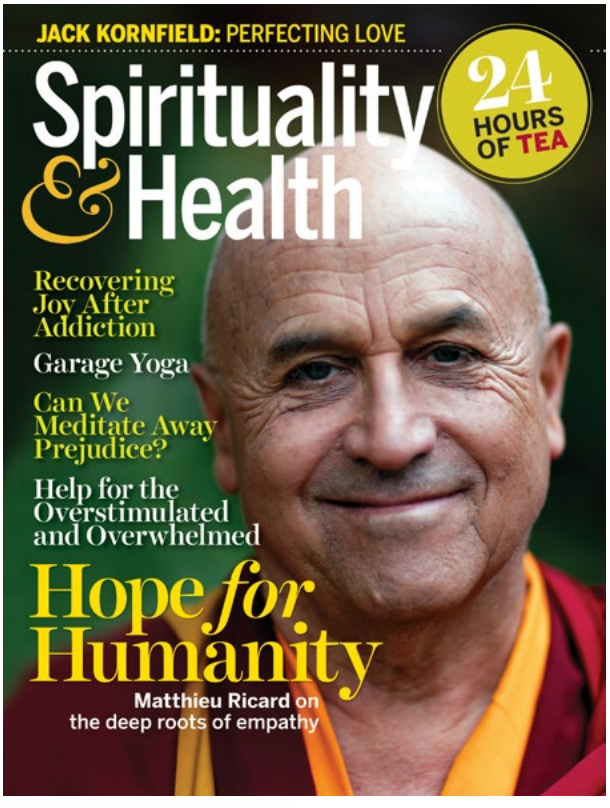
"It appears that people have a stable preference for valuing their time over making more money, and prioritizing time is associated with greater happiness," wrote lead researcher Ashley Whillans, a doctoral student in social psychology at the University of British Columbia. Slightly more than half of the participants chose to prioritize their time more than money, the study noted, and the older people were, the more likely they were to say they valued their time over money. "As people age, they often want to spend time in more meaningful ways than just making money," Whillans reported.

The study went on to suggest that making even small tweaks in your schedule—such as working a few less hours, paying someone to clean your home to ease the pressure on your weekend, or spending time volunteering—can lead to greater life satisfaction. "Having more free time is likely more important for happiness than having more money. Even giving up a few hours of a paycheck to volunteer at a food bank may have more bang for your buck in making you feel happier."

— KATHRYN DRURY WAGNER







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