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For more information, please see our Cookie Notice and our Privacy Policy. Source: Luna Lovegood/Pexels"Place one pound chopped watermelon, 1/2 cup pineapple juice, 1/2 cup white rum, 1/4 cup triple sec liqueur, and 1 tsp grenadine in the jug of a blender and blend until smooth."This is the recipe for Watermelon Mai Tai. Simple, right? Yes, but only because your working memory enables you to keep several pieces of information in mind at the same time. Your working memory is your mental workspace. When it functions as it should, it enables you to hold information in your mind for brief periods of time and manipulate that information mentally; for example, if given the numbers 8, 3, and 9, you can keep these digits in mind while adding them up without having to return to this page to double-check what digits you were given. If you cannot keep three single-digit numbers in mind for long enough to add them up, that's a clear mark of working memory problems. Working memory impairments appear to lie at the core of Attention-Deficit/Hyperactivity Disorder or ADHD. According to DSM-V, a diagnosis of ADHD requires the presence of six or more of the following symptoms for six months or more: forgetfulness, absentmindedness, carelessness, short attention span, difficulties listening, difficulties following instructions, trouble organizing activities, and a disliking of tasks that take mental effort. Do Learning Disabilities Have a Genetic Basis? According to Tracy Alloway, a professor of education, working memory is a bit like a mental jotting pad, and how good your working memory is will either ease your path to learning and success or hinder it. Alloway and her team conducted a large screening study of over 3,000 students. Of these, 10 percent were found to have working memory impairments that resulted in below age-expected performance on English and math tests, a poor attention span, forgetfulness, and difficulties following the teacher's instructions. The researchers hypothesize that differences in children's working memory are largely the result of differences in the children's genes and, hence, may not be correctible, at least not at a young age. Newer research, however, undercuts a purely genetic explanation of differences in working memory abilities. For example, studies have shown that training the working memory capacity in children with ADHD may significantly reduce the risk of long-term learning disabilities and poor academic performance. It thus appears that proper training can correct working memory deficits, even at a young age. The Effect of Training on the Capacity of Working MemoryIn the 1950s, Psychologist George Miller conducted studies of the capacity of our working memory, suggesting that we can only hold between five and nine items in our working memory at any one time. An item in working memory can be a digit, a letter, or a tone, or a more complex pattern, such as the name of a friend. Miller's findings that the maximum capacity of our working memory is nine items may seem surprising at first, as it would seem to predict that a U.S. phone number, including the area code, exceeds the capacity of our working memory.This, however, is not quite true. While we cannot hold more than nine items in mind at any one time, if Miller's findings are right, we can hold indefinitely more complex items in mind by using a process called "chunking." For example, the six-letter string "FBICIA" may count as two items for someone capable of grasping "FBI" and "CIA" in chunks, and the eight-letter string "LOLXOSYS" may count as three items ("LOL," "XO," and "SYS") rather than eight for someone familiar with the newspeak brought about by the invention of the internet and texting. Miller's studies of the capacity of working memory have been a major source of inspiration for future memory research and hypotheses about the mind. For example, they have been influential in developing the so-called global workspace model of the mind, according to which the mind contains an executive "desktop" with ever-changing, workable information spread across it. In today's internet culture, perhaps an even more apt metaphor for working memory is that of an email inbox that never contains more than seven emails, plus or minus two, which you can then manipulate by answering them or completing the requested task.Newer research has shown that Miller's magical number seven probably is too high. A more realistic estimate is that people can hold between one and four items in mind at any one time. The more recent findings have also shown that the capacity of working memory can be increased by practicing holding items in mind. Psychologists Bopp and Verhaeghen, for example, found that the working memory capacity of participants subjected to memory training tasks over a five-day period had expanded their working memory capacity from one to four items. These findings suggest that there isn't a set limit to the capacity of working memory. Other studies have yielded similar results. In one study, psychiatrist Klingberg and his colleagues recruited 53 children between the ages of 7 and 12 with ADHD and divided them into two groups. The children in the first group were given working-memory tasks that gradually increased in difficulty, and the individuals in the second group were given tasks that stayed at the same level of difficulty for the length of the trial. At the end of the study, the first groupthe group whose working memory tasks had gradually become more difficultperformed significantly better than the second group on the final tests of their working memory. Training Working Memory Repairs the Brain's Spam Filters GlitchesBut the hypothesis that a "workout" for working memory enhances our ability to keep information in mind and manipulate it by making us capable of juggling more information is not the only one currently on the table. Another is that working memory "workouts" can prevent irrelevant information from interfering with information processing in working memory. Neuroscientists McNab and Klingberg, for example, conducted a study in which they compared participants with poor working memory to individuals with especially good working memory. The volunteers were asked to remember items on a computer screen with different-colored squares while inside a brain scanner. The findings revealed that the areas of the prefrontal cortex in the front of the brain, which are involved in working memory tasks, became significantly more active during categorization-memory tasks in participants with particularly good working memory, but not in participants with working memory deficit. These results suggest that training doesn't necessarily improve working memory by expanding its capacity, allowing you to hold and manipulate more items at the same time. Rather, training may improve working memory by reducing its capacity, at least when it comes to irrelevant information that interferes with the task at hand. This, in turn, gives us good reason to think that working memory deficits needn't be the result of a limited working memory capacity but can also be the result of working memory allowing too much task-irrelevant information into the mental workspace. Like email spam, task-irrelevant information serves no function other than cluttering the mental workspace. An ultra-effective spam filter can prevent pointless clutter from filling up the mental workspace and distracting you from completing the task at hand. Nowadays, even an ultra-effective spam filter won't quite do the trick when it comes to preventing our inboxes from filling up increasingly more quickly, eventually ending up becoming completely unmanageable. But without the spam filter, it would take you days rather than hours to delete the unnecessary information and allow you to manipulate the information that you were supposed to work with. On this second way of explaining the benefits of a working memory workout, we can compare a poorly functioning working memory to a full and increasingly growing and cluttered email inbox, the kind of inbox that can prevent you from getting your work done.There are thus two ways in which training can potentially improve your working memory. One is by increasing the capacity of your global workspace, thus allowing you to mentally juggle more items at the same time. As long as task-irrelevant information doesn't enter your mental workspace, your ability to work with more items at the same time can result in more efficient information processing. The other way that a working memory workout can improve working memory is by fixing the glitches in the brain's spam filters, thus enabling your cognitive system to keep task-irrelevant information out of your mental workspace. With the distractors, you should be able to process information in your working memory more efficiently. References Alloway et al. (2009). The cognitive and behavioural characteristics of children with low working memory. Child Development, 80, 606-621. Miller, G. A. (1956). The magical number seven, plus or minus two: some limits on our capacity for processing information. Psychological Review, 63(2), 8197. Reddit and its partners use cookies and similar technologies to provide you with a better experience. By accepting all cookies, you agree to our use of cookies to deliver and maintain our services and site, improve the quality of Reddit, personalize Reddit content and advertising, and measure the effectiveness of advertising. 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By accepting all cookies, you agree to our use of cookies to deliver and maintain our services and site, improve the quality of Reddit, personalize Reddit content and advertising, and measure the effectiveness of advertising. By rejecting non-essential cookies, Reddit may still use certain cookies to ensure the proper functionality of our platform. For more information, please see our Cookie Notice and our Privacy Policy. Share on PinterestOur memories are an integral part of who we are, but as we age our memory declines. For many older adults, the decline becomes so serious that theyre no longer able to live independently, which is one of the biggest fears adults have as they age.The good news is that scientists have been learning more about our brains amazing capacity to change and grow new neural connections each day, even in old age. This concept is known as neuroplasticity. Through research on neuroplasticity, scientists have discovered that our memory capacity isnt fixed, but rather malleable like plastic.To take full advantage of neuroplasticity, youll need to exercise your brain and take care of your body. These 25 tips and tricks are some of the most effective methods for improving memory.Memory strength is just like muscular strength. The more you use it, the stronger it gets. But you cant lift the same size weight every day and expect to get stronger. Youll need to keep your brain constantly challenged. Learning a new skill is an excellent way to strengthen your brains memory capacity.There are many activities to choose from, but most importantly, youll need to find something that forces you out of your comfort zone and commands your full attention.learn a new instrumentmake potteryplay mind games, like Sudoku or chesslearn a new type of dance, like the tangolearn a new languageAny time you learn a new piece of information, youre more likely to mentally record that information if its repeated.Repetition reinforces the connections we create between neurons. Repeat what you hear out loud. Try using it in a sentence. Write it down and read it aloud.But the work doesnt stop there. Research shows that simple repetition is an ineffective learning tool if used on its own. Youll need to sit back down later and actively try to retrieve the information without looking at where you wrote it down. Testing yourself to retrieve the information is better than repeated studying. Practicing retrieval creates more long-term and meaningful learning experiences.Mnemonic devices can be in the form of acronyms, abbreviations, songs, or rhymes.Mnemonics have been tested since the 1960s as an effective strategy for students. Youve probably been taught a few mnemonic devices for remembering long lists. For example, the colors of the spectrum can be remembered with the name ROY G. BIV (Red, Orange, Yellow, Green, Blue, Indigo, Violet).Grouping or chunking refers to the process of dividing newly learned information into chunks to produce fewer, larger chunks of information. For example, you may have noticed that its much easier to remember a phone number if the 10 digits are grouped into three separate chunks (e.g. 555-637-8299) rather than one long number (5556378299).The mind palace technique is often used by memory champions. In this ancient technique, you create a visual and complex place to store a set of memories.For more instructions on how to create memory palaces, watch 2006 U.S. Memory Champion Joshua Foers TED talk.Another tactic of memory connoisseurs is that they dont just rely on one sense to help retain information. Instead, they relate information to other senses, like colors, tastes, and smells.Modern technology has its place, but unfortunately has made us mentally lazy. Before you reach for your phone to ask Siri or Google, make a solid attempt to retrieve the information with your mind. This process helps reinforce the neural pathways in your brain.Another common mistake is relying on the GPS every time you drive. Researchers found in 2013 that relying on response techniques such as GPS for navigation, shrinks a part of our brain called the hippocampus, which is responsible for spatial memory and moving information from short-term to long-term memory. Poor hippocampus health is associated with dementia and memory decline.Unless youre totally lost, try to get to your destination using your brain instead of just following the instructions on your GPS. Perhaps use GPS to get there, but use your brain to get back home. Your brain will thank you for the extra challenge.A busy schedule can maintain your brains episodic memory. One study linked busy schedules to better cognitive function. This study, however, was limited by self-reporting.An organized person has an easier time remembering. Checklists are one good tool for organization. Manually writing down your checklist (instead of doing it electronically) also increases the likelihood that youll remember what youve written down.Go to bed at the same time every night and get up at the same time each morning. Try not to break your routine on the weekends. This can greatly improve sleep quality.The blue light emitted by cell phone, TV, and computer screens inhibits the production of melatonin, a hormone that controls your sleep-wake cycle (circadian rhythm). A poorly regulated sleep cycle can really take a toll on sleep quality.Without enough sleep and rest, the neurons in our brain become overworked. They can no longer coordinate information, making it more difficult to access memories. Roughly an hour before bedtime, turn off your devices and allow your brain to unwind.These diets focus on eating:plant-based foods, especially green, leafy vegetables and berrieswhole grainslegumesnutschicken or turkeyolive oil or coconut oilherbs and spicesfatty fish, such as salmon and sardinesred wine, in moderationFatty fish are a rich source of omega-3 fatty acids. Omega-3s play an important role in building brain and nerve cells. Theyre essential for learning and memory and have been shown to delay cognitive decline.Proponents of the Mediterranean and MIND diets say to avoid the following foods:sugarprocessed foodsbutterred meatfried foodssaltcheeseSugar and fat has been linked to impaired memory. A recent study in humans found that a diet high in fats and sugars common in a Western diet impairs hippocampal memory. However, the study relied on questionnaires and surveys, which may not be as accurate.While you should still take your medications prescribed by your doctor, remember to follow your doctors instructions for dietary and lifestyle changes too.Some prescriptions, like statins for high cholesterol, have been associated with memory loss and brain fog. Losing weight and eating healthier may also play a role in treating high cholesterol.Other medications that might affect memory include:antidepressantsantianxiety medicationshypertension drugssleeping aidsmetforminTalk to your doctor about how to manage your medical conditions so you dont have to rely on a prescription forever. If youre worried about how a medication may affect your memory, talk to your doctor about your options.Exercising has been shown to have cognitive benefits. It improves oxygen and nutrient delivery to the body, and helps to create new cells in the brain which are essential for memory storage. Exercise especially increases the number of cells in the hippocampus.Theres no need for the exercise to be strenuous. Walking, for example, is a great choice.Humans are social creatures. Research shows that a strong support system is vital to our emotional and brain health. One study from 2007 found that people with very active social lives had the slowest memory decline. Just 10 minutes of talking to another person was shown to improve memory.Your brain is made mostly of water. Water acts as a shock absorber for the brain and spinal cord. It helps our brain cells use nutrients. So just a small amount of dehydration can have disastrous effects. Mild dehydration has been shown to cause brain shrinkage and memory impairment.Its true that moderate consumption of alcohol may have a positive effect on memory, but keep in mind that moderate means just one drink for women and two for men each day.Drinking more than that can have a negative effect on your ability to retain information as well as your sleep.Getting out into nature is incredibly important for our emotional and physical health. Enjoying nature can even be considered a form of meditation. One 2008 study found that a walk in a park improved memory and attention compared to walking in a city.Likewise, daily gardening lowers your risk of dementia by 36 percent, according to one 2006 study.One study from 2012 found that a mere 20 minutes of yoga significantly improved participants speed and accuracy on memory tests. Participants performed significantly better on the tests after yoga compared to aerobic exercise. The study, however, was limited by its narrow sample size of just 30 young, female students.Yoga also emphasizes breathing from the diaphragm, which helps maximize our oxygen intake, thus improving mental function.Our memory is a skill, and just like other skills, it can be improved with practice and healthy overall habits. You can start small. For example, pick a new challenging activity to learn, incorporate a few minutes of exercise into your day, maintain a sleep schedule, and eat a few more green vegetables, fish, and nuts.The next time you have to study for an exam, try one of the techniques suggested by memory champions, like chunking, mind palaces, or retrieval.Talk to your doctor if you notice that youre making many more mistakes than usual or have trouble completing simple daily tasks, like cooking or cleaning.Healthline has strict sourcing guidelines and relies on peer-reviewed studies, academic research institutions, and medical journals and associations. We only use quality, credible sources to ensure content accuracy and integrity. You can learn more about how we ensure our content is accurate and current by reading our editorial policy.Adan A. (2012). Cognitive performance anddehydration. T, et al. (2016). 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Mental exercising throughsimple socializing: Social interaction promotes general cognitive functioning.DOI: F, et al. (2010). Mindfulness meditation improvescognition: Evidence of brief mental training. DOI: Many teachers allow students to play brain games as part of the curriculum. When I say brain games, Im referring to short often fun activities that are unrelated to the core content, but which are thought to engage the mind or make you smarter. When I was a student, if I finished my classwork early I remember my teachers handing out little flipbooks with titles such as 99 impossible riddles or 99 super hard puzzles, and sometimes theyd set up a station at the back of the classroom containing board games and LEGO. These days, a teacher might allow students to hop onto Minecraft or play an educational video game once theyve completed their work, or as a break from academic learning. Generally speaking, I am not a fan of brain games as a teaching strategy. I appreciate that they might be an effective way to manage the behavior of the classs fast finishers, but Id prefer to have these students working on an extension activity that deepens their knowledge of the content, or spending the extra time reading their library books, instead. I want to maximize the amount of time that students engage with academic subjects while theyre at school, and most kids dont read enough. While I can appreciate the argument that brain games could be used as an incentive to motivate students to complete their work, I can also imagine some students rushing through their assignments in order to get to the brain game at the end of the rainbow.But the main reason Im not a fan of brain games is that Im skeptical of the idea that a puzzle, a game of chess, or a videogame can improve students cognitive abilities in general, rather than simply helping them get better at that particular activity. Whether or not brain games make you smarter, such as improving your working memory, is a question that researchers have debated for a long time. In 2014, a consensus statement was posted in the Stanford Center of Longevity that stated that To date, there is little evidence that playing brain games improves underlying broad cognitive abilities, or that it enables one to better navigate a complex realm of everyday life. This was followed by a rebuttal by another group of scientists, who claimed that the evidence in support of brain games now includes dozens of randomized, controlled trials published in peer-reviewed journals that document specific benefits of defined types of cognitive training. Many of these studies show improvements that encompass a broad array of cognitive and everyday activities, show gains that persist for a reasonable amount of time, document positive changes in real-life indices of cognitive health, and employ control strategies designed to account for placebo effects. While we can debate strengths and limitations of each study, it is a serious error of omission to ignore such studies in a consensus reviewing the state of this science. You can read more about this debate here, here and here. Susanne Jaeggi is one researcher who is optimistic about the potential of brain games and cognitive training. A few days ago I reached out to her with some questions and she invited me to attend her Twitch presentation with her colleague, Aaron Seitz, on this topic. I was able to get a few of my questions answered during the live stream, which I thought Id share in this blog, along with the researchers responses (edited for clarity). Jaeggi: This is a super important question, right? So, if you want to teach math and you have a limited time to teach kids math, your best strategy for the kids to do better in math is to teach them the exact math skills that they need to know. That is still the most efficient way to go. That said, there are other ways, and this is work that we are also doing together, Aaron and I, where you could support kids in giving them interventions or an app that they can play at home or in their free that they can play on their tablets where they can improve some of these crucial working memory skills that can support their learning in math as well. And we have done some studies with my collaborators in a university in China where we have specifically compared kids learning these are pre-school and kindergarten kids who have been training on these working memory training games in an extracurricular environment and we were able to show that kids who struggled in working memory and also struggled in math learning and literacy, that giving them the means to train working memory allowed them to catch up to typically developing peers later on. So they underwent this four week intervention of ten minutes a day of training on working memory after school and they were able to catch up to their peers. So, were not in a situation where we can easily implement this working memory training in the classroom, its a little complicated there are time constraints as the teacher was saying, there is only so much you can do, but there are still other means for supporting kids at home. You can do other things too: you can have them play board games with their families, with their siblings, which are also known to support working memory skills. So they dont necessarily have to be on their phone or on an app to support working memory skills. Working memory training is just one tiny puzzle piece or a contribution that can help support their learning more broadly. Jaeggi: That is a good question. So we have used a variety of active controls and it really depends on the context, too. So an ideal control we think would be an intervention thats believable so that participants think theyre also training something thats useful, but that does not require working memory and attention skills. And given that working memory is so ubiquitous in everything we do its actually not quite so simple to come up with an active control that is engaging, is believable, but that does not require working memory skills. So one intervention that seems to be working quite well in that regard is what we call a knowledge training or general knowledge/vocabulary training where people do sort of like GRE- or SAT-type questions, they get these vocabulary/general knowledge skills that also become increasingly harder as they go on. They find these really interesting and engaging, and its also related to memory but not to working memory. And that has been shown to be quite believable, but also engaging active control that we have liked using quite a bit. Jaeggi: (laughs) Right, I think this is a big reason why working memory training, cognitive training, has been so controversial, because it really went against this belief that working memory is something that youre born with. That this fixed capacity, like fluid intelligence or any of these capacities, that were born with this and basically thats what we have to deal with. But our work, and also our work in the role of experiences on cognitive function, has clearly shown that working memory is indeed malleable and susceptible to a host of different environmental impacts in a positive way, but also in a negative way. So one example, as Ive mentioned before, is when youre stressed, your working memory will not be as good when youre testing it as opposed to when youre in a good mood and you slept well. Thats when your working memory shows better performance. If you do this working memory training in a targeted way as weve described it, theres quite a bit of evidence that we can improve working memory skills very specifically. So, in that sense, it really goes against this belief that working memory/executive function is this immutable trait. Seitz: And one thing Ill add, which I think kind of makes this idea obvious: if you look at cognitive aging, what you find is that the trajectory of working memory as you age differs tremendously across people. And thats not just true of working memory, its true of essentially any cognitive skill. So lets assume that you have these different working memory abilities that are fixed across people. That might be at a point in time. As you age, what you find is that people move away from that point in different ways. And so, what you find is this massive variability in older adults that is much greater than what you find in younger adults. And then, when you start looking at some of these working memory training interventions, there is some evidence that what they do is they reduce the variability. So, all it did was bring you back to where you used to be when you were younger. Its not going against this cognitive load theory in any way. Its basically saying that you had some propensity, whether it was because of age or maybe you had cancer and you had chemotherapy, or you were depressed, and there are all sorts of things that happen in life that move you away from where you could be that activities that are effective at exercising your skills can move you back to your propensities. So these can be very complimentary theories. It really becomes obvious, especially when you look at trajectories across a lifespan, that there arent contradictions if you want to hold them both as truths. Interesting, right? So, after listening to the presentation, here are my current thoughts on this issue: Brain training is not ready for the K12 classroom, but one day, maybe, it could be used as a targeted intervention for specific students. We have to be careful that such an intervention comes after a proper diagnosis from a professional and that the intervention doesnt use up time that could be spent doing something else that is more beneficial. Working memory training might also be used, one day, to return adults with somewhat inactive working memories to their previous peak working memory performance, or to delay cognitive impairment in older adults. For K12 children, however, I suspect that school subjects do a pretty good job of keeping their working memories active. Until researchers resolve the brain training puzzle, I suggest we avoid placing too much faith in brain games and instead focus on delivering a rigorous, coherent curriculum full of powerful ideas and concepts. With that, Ill leave you this QR code (below), which will allow you to join the researchers next study. Zach Groshell Subscribe to get the latest posts sent to your email. Zach Groshell, PhD is a highly distinguished teacher, instructional coach, and education consultant. Zach is based in the Seattle area and works with schools around the globe to develop high quality instruction based on the science of how kids learn. Zach hosts the podcast, Progressively Incorrect, and is the author of Just Tell Them: The Power of Explanations and Explicit Teaching. View all posts by Zach Groshell Education Rickshaw is the website and blog of Zach Groshell, PhDTwitter/XLinkedInBlueSkyContactNew book! 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Engaging in cognitive training activities, such as those found in the Dakim Brain Fitness program, can help strengthen your memory and other cognitive functions. These activities are designed to challenge your brain in a fun and engaging way, promoting neuroplasticity and improving cognitive reserve. 2. Practice Active Recall One of the most effective techniques for improving memory is active recall. This involves actively recalling information from memory rather than simply re-reading it. Quiz yourself or test your memory by trying to recall key pieces of information without looking at your notes or other resources. 3. Use Visualization Techniques Visualization is a powerful tool for improving memory. By associating pieces of information with vivid mental images, you can encode information more effectively in your brain. This technique is particularly useful for remembering sequences or lists of items. Breaking down information into smaller chunks can make it easier to remember. This is because our working memory has limited capacity, and trying to hold too much information in memory at once can lead to overload. By dividing information into manageable chunks, you can process and retain it more effectively. 5. Get Enough Sleep Sleep plays a critical role in memory consolidation, the process by which short-term memories are converted into long-term ones. During sleep, especially the deep sleep stages, your brain replays and processes memories, strengthening the connections between neurons. Ensuring you get enough quality sleep each night is essential for memory improvement. 6. Maintain a Healthy Lifestyle A healthy lifestyle supports brain health and, by extension, memory. This includes eating a balanced diet rich in fruits, vegetables, and whole grains, staying hydrated, and engaging in regular physical activity. Exercise, in particular, has been shown to promote blood flow to the brain and support the growth of new neuronal connections. 7. Manage Stress Chronic stress can have negative effects on memory and cognitive function. When were stressed, our bodys fight or flight response is triggered, releasing cortisol and other hormones that can interfere with memory formation and retrieval. Engaging in stress-reducing activities, such as meditation, yoga, or deep breathing exercises, can help mitigate these effects. 8. Stay Social and Engaged Social engagement and staying mentally active can build cognitive reserve and support memory health. Engaging in activities that challenge your mind, whether through work, hobbies, or learning new skills, can help keep your brain active and resilient against cognitive decline. 9. Limit Multitasking While multitasking might seem like an efficient way to get things done, it can actually hinder memory and cognitive performance. When you multitask, youre not giving your full attention to any one task, which can lead to shallower processing and reduced memory encoding. Focus on one task at a time to ensure youre encoding information into your memory effectively. 10. Stay Organized Staying organized can help reduce cognitive load and make it easier to remember important information. Use tools like calendars, to-do lists, and reminders to keep track of tasks and appointments. This can help free up mental resources for more complex and creative tasks. How often should I engage in cognitive training to see noticeable improvements in memory? + Consistency is key when it comes to cognitive training. Aim to engage in activities that challenge your brain at least 2-3 times a week, with sessions lasting around 20-30 minutes. Over time, as your brain adapts, you may need to increase the difficulty or duration of your sessions to continue seeing improvements. Can dietary changes alone significantly improve memory? + While dietary changes can support brain health and potentially improve memory, they are most effective as part of a comprehensive approach that includes regular cognitive training, physical activity, and adequate sleep. Foods rich in omega-3 fatty acids, antioxidants, and other nutrients can help support brain function, but significant memory improvement is likely to result from a combination of lifestyle factors. By incorporating these strategies into your daily routine, you can take proactive steps towards boosting your memory and supporting overall cognitive health. Remember, the key to effective memory improvement is consistency and a holistic approach to brain health. You, too, can train your brain to become a memory athleteone of those prodigious memorizers who compete to remember the longest sequence of playing cards, or put the most names to faces in the least amount of time. To perform such cognitive feats, memory athletes rely on an ancient mnemonic strategy called method of loci (Latin for places) or memory palace, the term Joshua Foer used in his popular book on memory champions, Moonwalking with Einstein. A new study published this week in Neuron compares, for the first time, the brains of memory athletes to those of regular folks given six weeks of training in the method of loci system. The non-athletes not only achieved similar feats of memory, but they also exhibited the same brain changes seen in the memory athletes with much stronger functional connectivity across relevant networks. The study was a collaboration between the Donders Institute for Brain, Cognition and Behavior in the Netherlands and the lab of Dr. Michael Greicius of Stanford University School of Medicine. Researchers scanned the brains of 23 memory athletes and 51 controls who had never memorized anything out of the ordinary, but were evenly matched with the athletes in all other respects, including IQ. Controls were then randomly assigned to method of loci training, a working memory task, or no training at all, and rescanned. Before and after training, the controls were given 72 words to memorize. The method of loci group more than doubled the number of words they rememberedfrom a mean of around 30, they increased by an average of 35 words. Many got all or close to 72 words. And the pattern of functional connectivity in their brains changed to look more like the memory athletes as well. Networks handling visuospatial and memory processing bulked up and were more tightly linked. The other two control groups didnt see a significant change in either their memories or their brains. Even four months later, the loci group showed improved recall, while the others did not. I asked one of the lead authors, Martin Dresler of the Donders Institute, about the method of loci and what the study might mean for run-of-the-mill glasses-losing, name-forgetting humans.How does the method of loci work?It's been used for thousands of years. You use spatial or environmental cues to help learning and memory. Most memory athletes use a route, through their house or from home to work, and identify salient landmarks. To memorize their shopping list, they might imagine stuffing bread in the mailbox. At the first traffic light, they imagine green or red apples instead of green or red lights. When they want to retrieve the information, they mentally re-travel the route and pick up the information. Memory athletes insist they, too, lose their keys. Really?They all say they didnt have particularly good memories at birth, but they trained in these mnemonic strategies. Its a strategic kind of memory you apply. If you learn the strategy, but dont use it, you arent any better than before. You have to apply it when putting the keys somewhere, or youre just as likely to lose them. Why does the method work so well?Probably because our brains didnt evolve to memorize or learn abstract information, they evolved to learn the way to the next food source or where to meet our mating partners. The method of loci makes use of these evolved skills to find your way through the environment, to know where in space certain locations are hidden and what is associated with each space. Neuroscientist and study co-author Boris Konrad at work during a memory competition. Have you tried it?One of my co-authors, Boris Konrad, has been a memory athlete for many years, quite a successful one. He always tries to get me to use these memory techniques. When I do, Im capable of memorizing the first 100 digits of Pi or something like that, but mostly Im just too lazy. To really become good at it, you have to invest in some training. What did we know about the brains of memory athletes before this study?Very little. One landmark paper about 12 years ago put eight athletes in the scanner. The brains were completely normal [with no] anatomical or structural differences. But [while memorizing], spatial and visual areas were more activated compared to controls. And what did you find?We looked at functional connectivity [or how tightly linked brain areas are] between and within those networks. The more similar a training participant became on the neural level with the memory athletes, the better he was after training.Can people try this at home?We used an online training platform in the study called Memocamp, but most of the memory athletes googled the method and started that way. Many of them do not train super-regularly. A few weeks before a memory championship, they start to train half an hour a day or so, but then maybe they dont train for a half a year. With this technique, even at a low baseline, you can strongly improve your memory. References Dresler et al., "Mnemonic Training Reshapes Brain Networks to Support Superior Memory." Neuron 93, (2017): 1-9. Maguire, Eleanor A., et al. "Routes to remembering: the brains behind superior memory." Nature neuroscience 6.1 (2003): 90-95. Get the help you need from a therapist near youa FREE service from Psychology Today. 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