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Superaging, the new phrenology, and the gluten-free diet for the brain

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A RECENT ARTICLE IN THE *Journal of Neuroscience*¹ studied people between the ages of 60–80 who had intact cognition and memory; the oldest in the group are known as “superagers.” It reported that a particular location in the brain was enlarged compared to normal controls of the same age and gender. This same region had been also found to be enlarged in individuals whose careers were spent in jobs working on difficult mental tasks, that is, solving hard problems. In a newspaper article, one of the researchers took this to mean that working on solving hard problems was one key to superaging. She cited her father-in-law, who was sharp at an advanced age, a result she ascribed to his daily physical and mental efforts. She was a non-physician researcher and apparently hadn’t met many patients who exercised and thought as hard or harder than this lucky man but who didn’t do so well. Her point, stated clearly, was that simple mental exercises, things like crossword puzzles and Sudoku, weren’t adequate, that one had to think *hard* to avoid dementia. Not satisfied



with the often-repeated homily, “no pain, no gain,” she instead cited a Marine Corps motto: “Pain is weakness leaving the body.”

I don’t know the researcher. My guess is that she believes that she thinks hard. She probably exercises a lot as well. I wonder if she’s

been using the MRI scanner on the sly to check the size of her brain.

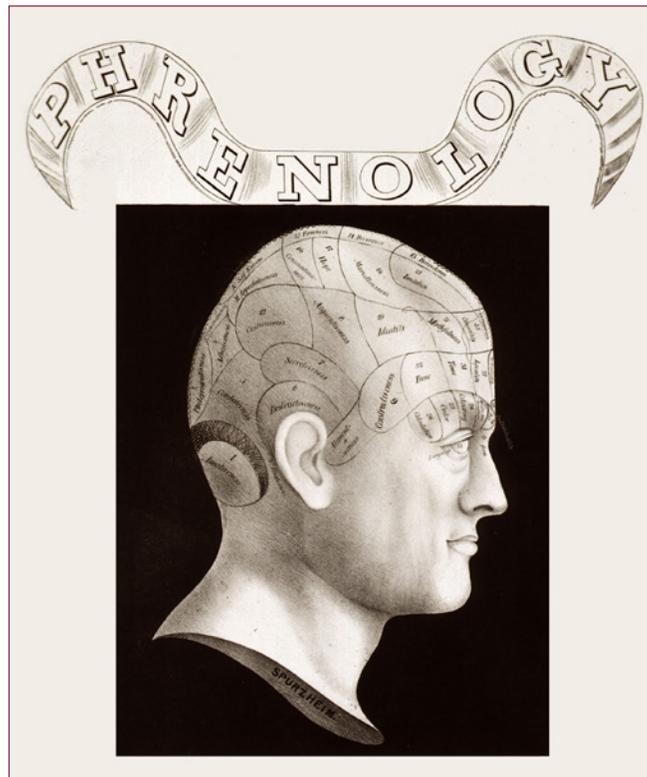
This is the gluten-free diet solution for the brain. “If it’s hard to do and I do it, it must be good for everyone.” I get upset

by such simplistic remarks. I am not stating that she is wrong. I am stating that she doesn’t know if she’s right, but likes the idea enough that she has convinced herself that she is. I, on the other hand, older, more jaded, find her suggestion is no better than the warnings I heard in my youth that eating chocolate produced acne. Like every other teen, my acne waxed and waned regardless of my chocolate consumption.

There are a lot of problems with scientists overstepping their knowledge to make statements that they’d like to be true. We see this weekly with epidemiological studies showing that eating something or not eating something

is associated with cancer, dementia or optimism. We’ve been through many revisions of suggested eating pyramids as we learn that the latest one wasn’t so good. Why we haven’t learned that none of them are good is beyond me.

The first problem with this brain theory is that observing a correlation that makes sense and fits with a hypothesis doesn’t make it true, and the second is the lack of any data to support the recommendation. Do mathematicians, physicists and philosophers get demented less than their peers? Well, the answer is yes, but it is not their hard thinking but their



intelligence and education that conveys the benefit. Smart, educated carpenters and dishwashers do just as well. And who's to say what hard thinking is? Did Einstein think hard or did his insights just spring into his mind via the muse of physics? Did Mozart think just as hard? Do you have to be a neuroscientist to benefit from hard thinking? Did Einstein think harder about his problems than I do when I try to figure out how to write a dataset into a readable paper? We don't have mental calorie counts. Should we all be trying to solve differential equations? Will a less intelligent person develop a more developed brain than the one who finds these challenges less demanding? The research paper suggests that one probably needs to be very smart and to think hard.

Overlooked in this particular claim for intellectual supremacy via a bigger and better brain, are data that in diseases of the brain which cause them to shrink due to cell loss, and certainly work less well, there are often parts that actually increase in size. Brain loss is not uniform. Are these larger regions compensating? Perhaps, or more likely, the brain cells that should be there have died and are still dying but have been replaced by scar cells (gliosis). I suppose that it is indeed possible that the increased size of the identified

region in the brain is related to hard thinking, but I am not so confident they have not reversed chicken and egg. For example, do artists have larger occipital cortices, the region where vision is first activated, or perhaps another part of the brain where images are processed, or yet a different part, where images produce emotions? Do we see that the region of the brain that controls finger and hand movements are increased in professional violinists? We know that atrophy in the hippocampus, one region involved in memory, is a sign of Alzheimer's disease, so that preserved memory is associated with less dementia, even in people with the disease. Perhaps these people worked at remembering things better?

What annoys me most is not the simplicity, but the idea that scientists, since they are the only ones who can study this, tend to think that people who act like they do, that is, "think hard," "solve difficult problems," basically "do what I do," are going to reap a more bountiful harvest than the rest of us.

Most basic science researchers don't credit most clinical researchers as thinking very hard in the first place. The next study might compare basic scientists with clinical neuroscientists to see whose brain region is bigger.

In the meanwhile, keep thinking. ❖

Reference

1. Sun F, Stepanovic M, Andreano J, Barrett LF, Touroutoglou A, Dickerson BC. Youthful Brains in Older Adults: Preserved Neuroanatomy in the Default Mode and Salience Networks Contributes to Youthful Memory in Superaging. *J Neurosci*. Sept. 2016; 36(37):9659-68.

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Your Life Made the Difference in How I Practice Medicine

ERIC J. CHOW, MD, MS, MPH

IT'S BEEN FIVE YEARS now since you passed. A day hasn't gone by that I haven't thought about our time together or that fateful day you took your own life. You were my partner in life and there's so much I wish to tell you as so much has changed since then. After four years of residency training, I am



about to graduate as a physician in internal medicine and pediatrics. I am newly engaged and I have had opportunities to travel the world since we last spoke. I feel that a lifetime of experiences and learning have taken place, especially in my medical training. As I reflect back now, I realize that I have taken care of a lot of patients between medical school and residency. Yet despite it all, your life and all its hardships still have the most lasting impacts on how I approach patient care.

I still remember that day we first learned that you had fibromyalgia. After all those years of unexplained symptoms, aching shoulders, unrelenting headaches, and chronic fatigue, we finally arrived at an answer but at what cost? After multiple doctor visits, specialists, rheumatological blood tests, trials of medications, we had finally ruled out any other explanation. At the end of the day there was no satisfactory treatment for your chronic fatigue and persistent muscle soreness and that left

us in a constant search of an answer that didn't exist. We endured long waits at the emergency rooms, eye rolls and polypharmacy that in a couple of instances with overdoses almost cost you your life. Despite our desperation to find help, we felt isolated and alone.

You were no stranger to feeling cast aside. We met so many people in the medical community along the way but no one took the time to understand your mental health struggles that began long before your physical symptoms. Disowned by your parents at an early age for being gay, you were left to figure out a way through life without the people who should have loved you unconditionally. You held out hope, answering every phone call from your parents wishing they would reconsider their decision only to be reminded that you were going to hell because of your "life choices." Ultimately our happy times together were not enough. You had experienced loss from so many different directions that you decided suicide was the only way you would find peace from the physical and mental anguish. Had we worked with your primary care provider to provide you comprehensive care to find people who understood you as a person rather than just a medical problem, perhaps you would still be here today.

As isolated as we felt at the time, I have come to realize that our experiences were not unique to us. Now as a young physician, many patients that I care for find themselves in similar situations as we did. They struggle to understand their chronic diseases by navigating a labyrinth of medical providers that only have time to focus on their physical ailments. I saw us in a refugee couple when the wife presented with persistent unexplained headaches. They came in weekly asking for more tests, more referrals, and more treatments but in the end, we had exhausted them all. They were left frustrated and hopeless much like we were. Then there was that dear lady who developed post-op pain from abdominal surgery. Her life was turned upside down because of the crippling pain. At every appointment, she and I would have tearful moments about how she yearned to live a normal life again but she now was losing hope.

Our training teaches us to rule out the medical emergencies. Make sure it's not a tumor or an impending bleed causing those headaches. Rule out the abdominal abscess or surgical abdomen that would explain the excruciating abdominal symptoms. But what then? Where does that leave the patient? Where did that leave us when we were searching for answers? I recall the sudden disinterest and resentment we faced after our tests came back negative. Specialists sent us back to the primary care provider. We spoke to more clinic

secretaries than doctors. On one occasion, a nurse in the emergency room said you were drug seeking. We were left with mixed emotions including anger, hopelessness and isolation, much like the patients I see today.

The day after you took your life, I made a promise that I would change the way I practiced medicine that reflected my life with you. If you didn't receive the personalized care that you needed, I would ensure that I would. I'll admit it wasn't easy. Between a busy schedule and challenging patients who sometimes took advantage of my empathy, there was a constant struggle to find the right balance in actual practice. Over time, however, I managed to adopt a few changes that allowed me to better address my patients' needs by connecting with them on a personal level. For those who had conditions I found medically frustrating, I would see these patients more often especially when symptoms worsen rather than push them away. I removed the computer

and white coat from patient encounters. Instead of rushing to medical tests and treatments, I spent the time learning about the person behind the diagnosis. Who were their family members? What did they enjoy doing? What did they look forward to the most? Inevitably, these conversations provided key pieces of information that changed my approach to their care. Sometimes this meant involving more than just the patient. We would discuss who their caretakers were and what hardships they have endured. We discussed ways to reshape life to cope with the new diagnosis rather than constantly fighting against it. While my patients may never be able to return to the normal life they once lived, they at least know they don't have to go it alone. In some of these patients I have seen remarkable changes in their lives. They have taken on new hobbies, started exercising and have made other dramatic lifestyle changes. They visit the emergency room less and no longer ask me for pain medication. Ironically, they

have asked me to space their appointments now because they had made vast improvements in their life and no longer required the frequent attention.

I wish we had more time to find you that confidante – a physician whom you could turn to who saw you more than an illness – as a person. I wish they could have brought you in closer rather than push you away. While things may not have worked out better for you, realize that life with you has allowed me to improve the way others are able to live theirs. You have given them hope that they don't have to live a life of perpetual solitude. You made a difference in my life, so I could make a difference in theirs. ❖

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