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THE HUMAN BRAIN: A NEW FRONTIER FOR HEALTHY LIFESTYLES

*Clinical neuropsychologist Paul D. Nussbaum was honored with the American Society on Aging's 2007 Gloria Cavanaugh Award at the recent Joint Conference of ASA and the National Council on Aging. The following article is based on the award lecture he presented at the Chicago conference. Nussbaum, an adjunct associate professor of neurological surgery at Pennsylvania's University of Pittsburgh School of Medicine, is author, most recently, of *Your Brain Health Lifestyle: Preserving Your Life Story* (Tarentum, Pa.: Word Association Publishing, 2007), available at (800) 827-7903. For information about his *Brain Health Lifestyle*, visit his website at www.paulnussbaum.com.*

By **PAUL DAVID NUSSBAUM**

For more than a decade, I have traveled the United States talking and writing about the human brain, the most miraculous and wonderful system ever designed. It literally defines who we are and what we become. The great paradox for me continues to be that as important as the human brain is, we know very little about it. There are many reasons for this, but primarily our culture has not set learning about the human brain as a high priority. The good news is that American culture has begun to shift and a healthy interest in the brain is emerging, especially with the aging of the boomer generation.

BRAIN PLASTICITY

Science has shown for some time that the brains of rodents and nonhuman primates can be shaped structurally and functionally by environmental input. In 1998, the first published study emerged to demonstrate the human brain has the ability to generate new brain cells (neurogenesis). New cells were found in the hippocampus, a critical part of the memory system located in the middle of each temporal lobe—the same region found to generate new brain cells in animals. This and subsequent studies have supported the idea that the human brain has *plasticity*: It is highly dynamic, constantly reorganizing and can be shaped across the lifespan.

Evidence of brain plasticity tends to refute the traditional school of thought that the human brain has a fixed and limited system incapable of generating new cells beyond a very early age. Plasticity in the human brain permits the opportunity to explore how people can generate new brain cells and how we can improve the health of our brains.

Because western culture has not focused on the human brain, we have not considered health and the human brain to coexist. Until recently our culture has viewed the heart as the center of our being and core of our identity. This is beginning to change as new findings emerge, revealing the human brain as the center of thought, emotion, motor skill and being.

I have looked to brain research on animals for guidance in forming a guide to human brain health. We know that three factors, socialization, physical activity and mental stimulation, help to create the enriched environments, which many scientists have found relates to positive structural and functional changes in animal brains. Research has demonstrated similar findings in humans suggesting people should consider these factors important to the human brain's health environment.

TWO OTHER FACTORS

I have added two factors that I believe are also basic to human brain health: *spirituality* and *nutrition*. Together, these five factors (socialization, physical activity, mental stimulation, spirituality, nutrition) form the core of my proposed brain-health lifestyle. It is important to underscore that the brain-health lifestyle is not bound by any age and that there is no critical period of brain development other than life itself. I define brain health as a proactive and lifelong pursuit.

By exposing our brains each day to the novel and complex and to the enriched environment, people can develop what is known as “brain reserve.” Brain reserve is the buildup of brain cell (neuronal) connections to such a degree that people may actually be able to delay the onset of neurodegenerative diseases, such as Alzheimer’s disease and related dementias. Research has actually described individuals diagnosed at autopsy with Alzheimer’s who never manifested the clinical aspects of the disease while alive. One explanation that has been offered is that these people had enough brain reserve to actually delay the onset of their brain disease.

A brain health lifestyle provides people an opportunity to focus on their own brain and behavior, as well as to consciously begin to affect change that will help to enhance their brain health. Some basic facts regarding the human brain always help to explain why the activities described are healthy.

Consider the following points about human brains:

- Your brain weighs on average between 2 and 4 pounds.
- Your brain demands 25% of the blood generated by each heartbeat.
- Your brain consists of more than 50% fat.
- Your brain will thank you for complex and novel stimuli.

THE BRAIN SHIFT

Brain health is becoming a major focus of interest as American culture shifts toward a better understanding of—and excitement about—new scientific revelations and the potential they represent. The health-conscious boomer generation will likely reinforce this shift and help to change personal and social behavior. Among the signs of change are frequent media references to brain health, the emergence of new business products that encourage mental stimulation, the growing in size and scope of lifelong learning programs, and increasing funding for brain-health initiatives.

The most significant change may occur at the individual level where people are taking a real interest in learning about the miracle that is their brain. I have observed thousands of people paying close attention as basic facts about the brain are explained to them. People do not change their behavior unless they comprehend the reasons for the change and see how it will benefit them. I love to hear stories from people who have started wearing pedometers or who have altered their diet, sometimes with difficulty. Americans have been hungry for information on how and why to adopt healthy lifestyles, and they are willing to exert much time, energy and money to maximize their health. Now this momentum extends to brain health.

The message of a proactive and lifelong brain health lifestyle is powerful and personally meaningful. It is also fun and practical. We will witness grocery stores and menus in restaurants identifying brain-healthy foods. Schools will continue to implement brain-health curricula; and business products such as brain health centers, mobile personalized devices and computer programs, will become the norm. Ultimately, I hope proactive brain health becomes a national priority and a fixture in everyone’s healthcare plan, home and place of work.

The greatest gift we have is our personal life story, the many experiences of our life that form our autobiography. Many people are afraid of losing their memory, but I would like to champion preservation of the life story. This more than anything else underscores the importance of beginning one’s proactive journey toward brain health. Each of us has much to share with the younger ones in our life circle. ❖