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## I'm a Retiree: My Brain After the Age of 60

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### Abstract

The work emphasizes that the brain of individuals over 60 years old is more practical than commonly believed. Despite reduced speed inherent in the younger brain, the older brain becomes more flexible, promoting sound decision-making and reducing negative emotions. The peak of intellectual activity in older individuals occurs around the age of 70, accompanied by an increase in myelin, resulting in a 300% improvement in intellectual abilities. With a healthy lifestyle, intellectual capacities do not decline with age but rather grow, reaching their peak between 80 and 90 years of age.

**Keywords:** older individuals, brain, intellectual abilities, myelin, healthy lifestyle

### Introduction

In his study on the aging of the human brain, Alexis Wnuk (2019) highlights that complex changes occur during the aging process of the human brain. Through the analysis of cognitive, structural, neuronal, and chemical changes, the research provides a detailed insight into the diverse aspects of brain aging.

Regarding **cognitive changes**, the research reveals subtle modifications in memory, attention, and working memory during aging (Hilčenko, 2022; Hilčenko, Nikolić, 2022). While certain abilities decline, such as autobiographical memory, other aspects, such as verbal abilities, spatial reasoning, and abstract thinking, may improve in middle age.

**Structural changes** involve a reduction in brain volume, especially in the frontal cortex, cerebellum, and hippocampus. These changes are not uniform, as different brain regions decrease at different rates. Studying these changes suggests the “last in, first out” theory, indicating that parts of the brain that develop latest during adolescence are the first to suffer from aging.

**Neuronal changes** include a decrease in neuron size, dendritic retraction, and synaptic reduction, which can impact learning and memory. Specifically, the loss of thin dendritic spines may contribute to cognitive decline, especially in working memory.

**Chemical changes** encompass a reduction in the synthesis of neurotransmitters, such as dopamine and serotonin, which can have implications for cognitive functions and memory.

Despite these changes, the research points to brain neuroplasticity during older years, meaning the brain can adapt its neural connections to face new challenges. Lifestyle is of great importance in mitigating the negative effects of brain aging: diet, physical, and mental activity (Hilčenko, Jakovljević, Nikolić, 2021).

Aging is a natural physiological phenomenon. Every living being in this universe ages, and as it does, numerous changes occur! Changes are not limited to the external appearance of people but also extend to internal organs and the brain! (Activ Doctors Online, 2018).

The brain changes with age include:

1. **Brain mass** – the mass of the brain decreases, especially in the frontal lobe and hippocampus.
2. **Cortical density** – the outer protruding surface of the brain thins, slowing cognitive functions.
3. **White matter** – the contraction of white matter leads to memory loss.
4. **Neurotransmitter substances** – reduced production of neurotransmitter substances such as serotonin, dopamine, norepinephrine results in various neurological disorders (Figure 1).



**Figure 1. What Happens to the Brain as We Age**

These are common changes in the brain as we age, and these changes are responsible for age-related neurological changes (Hilčenko, 2015a; Hilčenko 2015b).

**But – the surprise has arrived!**

*Director of the George Washington University Medical School (2022)* claims that the brain of an older person is much more practical than commonly believed. At this age, the interaction between the left and right hemispheres of the brain becomes harmonious, expanding our creative possibilities. Therefore, among people over 60 years old, you can find many individuals who have just started their creative activities.

Of course, the brain is no longer as fast as in youth (Gaftandzhieva, Hussain, Hilčenko, Doneva, 2023; Hilčenko, 2023). However, the brain gains in flexibility. Hence, as we age, we tend to make better decisions and are less susceptible to negative emotions.

The peak of human intellectual activity occurs around the age of 70 when the brain begins to function at full capacity. Over time, the amount of myelin in the brain increases, a substance that facilitates the rapid passage of signals between neurons. Consequently, intellectual abilities increase by 300% compared to the average (New England Journal of Medicine, 2023).

It is also interesting to note that after the age of 60, a person can use both hemispheres at the same time. This allows tackling much more complex problems (Figure 2).

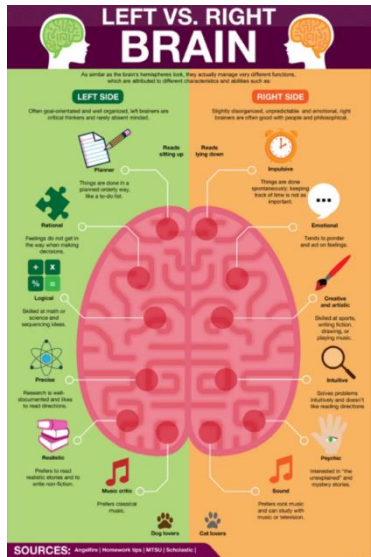


Figure 2. Left vs. Right Brain

Professor Monchi Uri from the University of Montreal (Monchi, 2023) believes that the brain of an older person chooses a path that consumes less energy, eliminates unnecessary elements, and leaves only the right options for problem-solving. A study was conducted involving different age groups. The younger participants were quite confused while undergoing tests, whereas those older than 60 years consistently made correct decisions.

The characteristics of the brain between the ages of 60 and 80 are truly “rosy.”

### ***Characteristics of the Older Person’s Brain***

- Neurons in the brain do not die, as everyone around you claims. The connections between them simply disappear if a person does not engage in mental activities (Hilčenko, 2015c; Hilčenko, 2019).

- Disturbances and forgetfulness arise due to an excess of information (Hilčenko, 2009). Therefore, you don’t have to focus on unnecessary details throughout your life.

- From the age of 60, a person, when making decisions, uses not only one hemisphere of the brain, like young people, but both.

### ***Health Advice for Individuals Over 60***

- Do not fear old age.

- Strive for intellectual development, Solve mathematical puzzles (Hilčenko, 2008).

- Learn new skills, work on the computer (Hilčenko, 2006), create music, learn to play musical instruments, paint pictures! Dance!

- Engage in life, meet and communicate with friends, make plans for the future, travel as much as possible.

- Don’t forget to go to stores, cafes, and performances.

- Do not isolate yourself; it is detrimental to everyone.

- Be positive, always live with the thought: “All good things are still ahead of me!”



### **Conclusion**

Research on the aging of the brains of individuals over 60 years old reveals surprisingly positive results. Despite certain changes, such as a decrease in speed, reduction in brain volume, and chemical alterations, the brain of an older person becomes surprisingly practical. Brain flexibility at this age encourages making correct decisions, reducing negative emotions, and expanding creative possibilities. The peak of intellectual activity is reached around the age of 70,

with an increase in myelin resulting in significant improvement in intellectual abilities. The importance of a healthy lifestyle, including nutrition, physical and mental activity, is crucial for preserving and enhancing intellectual abilities in old age. Therefore, instead of decline, intellectual abilities grow and reach their peak between 80 and 90 years of age.

Individuals over 60 can expect surprisingly positive brain characteristics by dedicating themselves to healthy habits and continuous intellectual development.

## References

- Activ Doctors Online (2018). *What Happens to The Brain as We Age*. <https://www.activdoctorsonline.com/blog/brain-age/> (17.05.2024).
- Director of the George Washington University Medical School (2022). *Good News about the Brain of an Elderly Person*. <https://thepost.org.za/good-news-about-the-brain-of-an-elderly-person/> (25.05.2024).
- Gaftandzhieva, S., Hussain, S., Hilčenko, S., Doneva, R. (2023). Data-driven decision making in HEI: State-of-play. *Tehnički vjesnik – Technical Gazette*, 0.864.
- Hilčenko, S. (2006). Multimedijski obrazovni softver: "Od igre do računara" (2). *Pedagoška stvarnost*, 9–10, 750–770.
- Hilčenko, S. (2008). Obrazovni softver kao interaktivno manipulativno i motoričko podsticajno sredstvo u razrednoj nastavi. *Pedagoška stvarnost*, 1–2, 69–78.
- Hilčenko, S. (2009). *Two Examples of Methodology for Working with Multi Media Educational Software in Primary School 1st Grade*. Iwonicz Zdroj: The University of Rzeszow.
- Hilčenko, S. (2015a). An E-model of a Flipped & Heuristic and Functionally & Logical Learning for the Generation "Z" in the Classwork. *International Journal of Elementary Education*, 4(3), 65–79.
- Hilčenko S. (2015b). A model: animated logical mathematical tasks for the younger elementary school children (Model: animirani logički zadatak iz matematike za mladi školski uzrast). *IOSR Journal of Research & Method in Education*, 5(4), 39–42.
- Hilčenko, S. (2015c). School customized for the Generation „Z“. In: 22<sup>nd</sup> International Scientific Conference Society And Technology, 91–99.
- Hilčenko, S. (2019). *IKT u vaspitno-obrazovnom radu, udžbenik za studente*. Subotica: Visoka škola strukovnih studija za obrazovanje vaspitača i trenera.
- Hilčenko, S. (2022). Metodika rada naprimjeru razvijanja pojmova: ispred-iza-između – kombinacija tradicionalnog učenja i ICT u vrtiću. *Hrvatska, časopis: Informatologija*, 55, 246–256.
- Hilčenko, S., Jakovljević, N., Nikolić, S. (2021). Didactics: logical operation – operation in preschool. *Education – Technology – Computer Science*, 32, 11–17. DOI:10.15584/jeta-comps.2021.2.1.
- Hilčenko, S., Nikolić, S. (2022). Approach to the subject "Deteikologija" by applying ICT at preschool institution. *Journal of Education, Technology and Computer Science*, 3(33), 51–57. DOI: 10.15584/jeta-comps.2022.3.5.
- Hilčenko, S., Nikolić, S. (2023). Child: "I Don't Understand – We Didn't Learn That in Kindergarten!". *Journal of Education, Technology and Computer Science*, 4(34), 41–48. DOI:10.15584/jeta-comps.
- Professor Monchi Uri from the University of Montreal (2023). *Forward to those aged 60, 70, and 80 to be proud of their years*. Retrieved from: <https://book.hr/proslijedite-onima-od-60-70-i-80-godina-kako-bi-bili-ponosni-na-svoje-godine/>; <https://deemagclinic.com/2021/07/06/aging/> (5.06.2024).
- Wnuk, A. (2019). *How the Brain Changes with Age*. <https://www.brainfacts.org/thinking-sensing-and-behaving/aging/2019/how-the-brain-changes-with-age-083019> (14.06.2024).