Aging, Memory, and Cognition

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Advanced age is often associated with higher rates of mild cognitive impairment. This type of impairment is frequently viewed as a precursor to Alzheimer's disease. There are different rates of brain area deficits found in the aging progression. Cognitive decline can vary greatly among different individuals. Procedural memories decline the least, whereas the memory-based process of encoding and retrieving information is a challenge for many elderly. Cognitive and memory concerns most encountered include verbal fluency or finding the right word that is 'on the tip of your tongue' but just out of reach of expression. This certainly can be a source of frustration to anyone.

Aging is often associated with the act of forgetfulness. This phenomenon is sometime perceived by the person experiencing it as a frustrating vagueness or poor memory and by others as absentmindedness. These types of recollection challenges fall under the domain of cognition and memory. As a mental process, cognition is the manner in which we perceive, understand, and reason. It is our awareness, our thoughts, and intellect. Memory is the process of storing and retrieving or remembering what we have learned. It is both long-term and short-term in regards to where and how we archive or store information we will later seek to recall.

What are some of the underlying reasons for not being able to quickly and accurately recall a particular word (or person, place, and event)? Well, as you age the blood flow volume to your brain decreases. Concurrent to this process is shrinkage of the cortex, a decrease in neuron cells, and a reduction in the extensiveness of connections between your neurons. [1] Your brain is the most complex and least understood organ and many of its intricacies remain unknown to current science. Although brain and body processes slow down with aging, cognitive failure is not a normal part of the aging process. Brain plasticity, in a healthy elderly person, compensates for some of the difficulties certain brain regions may incur over time. Cognitive reserve is supportive of the brains ability to adapt to change and a level of tolerance in face of some life-time damage. However, unabated, precipitous cognitive decline is a major risk factor for disability, dementia, and death.[6]

Cognitive processes that show some decline with age include those involving paying attention (necessary to learn, understand, and stay on task), working memory capacity (the amount of information you can work with, without losing track of one or more tasks), inferences (hampered by the inability to ignore irrelevant information), information encoding (putting information into your memory) and information retrieval (recalling what you know). Encoding is the process of storing or putting information into your memory. Retrieving is the recovery of information from the memory, or taking information out of your memory when it is needed. Procedural memories are least affected by aging because of their long-term, life-time, externally based foundations.

Memory decline is most often associated with some physical factors such as cardiovascular disease, high blood pressure, diabetes, atherosclerosis, or Alzheimer's disease.[4] Cognition can be affected by your senses. For example, there is a connection between visual apperception and cognitive impairment. Untreated vison problems such as cataracts, glaucoma, and macular degeneration can increase your risk for cognitive impairment. Perceptual deficits whether in sight, hearing, or olfactory impairment can burden your cognitive resources.[3]

Aging does have some effects of on mental function even in healthy older people. Some may notice a modest decline when trying to learn new things and when trying to remember information, however, a major decline in mental abilities is not inevitable as you age. Aging is not an impediment to learning new things. We just need to take our time, take a little extra time, and work a little harder at it. So throughout those elder years continue to seek new stimulating challenges, mentally and physically, to keep your wits sharp!

You can sustain good brain function as you age. The varieties of interacting factors that influence your brain function include physical health, psychological health, and your socioeconomic well-being. Your overall health, lifestyle, environment, and genetics also may play a role.[5] As much as possible you want to keep what you have and add more good things that are supportive of brain health. Social and spiritual engagements and interactions are great resources to enhance your personal well-being. Stimulating social, intellectual, and physical activities are protective factors against cognitive decline in older age. Decreases in cognitive lifestyle

activities are linked to subsequent declines in measures of verbal speed, episodic memory, and semantic memory. [5] When cognitive functioning declines, lifestyle engagement, especially those related to social activities, gradually decrease in both quantity and quality. Behaviors such as physical inactivity, obesity, smoking, or excessive alcohol consumption are detrimental to cognitive functioning and best mental health. Almost all chronic health conditions are strongly related to aging and your chosen lifestyle.

Many lifestyle factors influence your aging, your physical and mental health and keeping your mind sharp. You can embrace certain habitual activities that can help you in your efforts to keep your mind sharp.

- Stay physically active with regular exercise
- Stay mentally active by engaging in intellectually stimulating activities
- Stay socially active, engaged with life, maintaining close social ties with family, friends, and community[2]
- Enjoy a healthy nutritious diet of real food that is not refined, processed, or bio-chemically manipulated
- Become more proactive about your health. Control your risk factors for chronic disease, such as heart disease and diabetes by maintaining healthy blood pressure and cholesterol levels, a healthy weight, etc.
- Adopt a better attitude (put away your stress and strife and put a smile on your face)

Note:

> *Cognitive reserve refers to the brain's ability to operate effectively even when some function is disrupted. It also refers to the amount of damage that the brain can sustain before changes in cognition are evident. People vary in the cognitive reserve they have, and this variability may be because of differences in genetics, education, occupation, lifestyle, leisure activities, or other life experiences. These factors could provide a certain amount of tolerance and ability to adapt to change and damage that occurs during aging. At some point, depending on a person's cognitive reserve and unique mix of genetics, environment, and life experiences, the balance may tip in favor of a disease process that will ultimately lead to dementia. For another*

> *person, with a different reserve and a different mix of genetics, environment, and life experiences, the balance may result in no apparent decline in cognitive function with age.*
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> *National Institute on Aging (2008). The changing brain in healthy aging.*

References

1. American Psychological Association (2006). Memory changes in older adults. Retrieved from http://www.apa.org/research/action/memory-changes.aspx
2. Hill, A. (2016). Elderly well-being in the context of loneliness, depression, and social support. (Doctoral Dissertation). Retrieved from Argosy University Library.
3. McPherson, F. (n.d). Neglect your senses at your cognitive peril. Retrieved from http://www.mempowered.com/aging/neglect-your-senses-your-cognitive-peril
4. McPherson, F. (n.d.). Memory in normal aging. Retrieved from http://www.mempowered.com/aging/normal
5. National Institute on Aging (2008). The changing brain in healthy aging. Retrieved from https://www.nia.nih.gov/alzheimers/publication/part-1-basics-healthy-brain/changing-brain-healthy-aging
6. Small, B. J., Dixon, R. A., McArdle, J. J., & Grimm, K. J. (2012). Do changes in lifestyle engagement moderate cognitive decline in normal aging? Evidence from the Victoria longitudinal study. Neuropsychology, 26(2), 144-155. http://dx.doi.org/10.1037/a0026579.
7. Xavier, A. J., d'Orsi, E., de Oliveria, C. M., Orrell, M., Demakakos, P., Biddulph, J. P., & Marmot, M.G. (2014). English longitudinal study of aging: Can internet/email use reduce cognitive decline. Journals of Gerontology Series A, Biological Science and Medical Science, 69(9), 1117-1121. http://dx.doi.org/10.1093/gerona/glu105.