International Journal of Movement Education and Social Science
IJMESS Vol. 7 Special Issue 01 (Jan-June 2018) www.ijmess.org
ISSN (Print): 2278-0793
ISSN (Online): 2321-3779

Memory Changes in Older Adults

Kottapalli Sirisha Rani

Assistant Professor of Psychology

RGUKT IIIT SRIKAKULAM

"Senior moments" less inevitable than once thought.

ABSTRACT

There is considerable debate on whether working memory storage is mediated by distinct subsystems for auditory and visual stimuli (Baddeley, 1986) or whether it is constrained by a single, central capacity-limited system (Cowan, 2006). Recent studies have addressed this issue by measuring the dual-task cost during the concurrent storage of auditory and visual arrays (e.g., Cocchini, Logie, Della Sala, MacPherson, & Baddeley, 2002; Fougnie & Marois, 2006; Saults & Cowan, 2007). However, studies have yielded widely different dual-task costs, which have been taken to support both modality- specific and central capacity-limit accounts of WM storage. Here, we demonstrate that the controversies regarding such costs mostly stem from how these costs are measured. Measures that compare combined dual-task capacity with the higher single-task capacity support a single, central WM store when there is a large disparity between the single-task capacities but not when the single-task capacities are well equated . In contrast, measures of the dual-task cost that normalize for differences in single-task capacity reveal evidence for modality-specific stores, regardless of single-task performance. Moreover, these normalized measures indicate that dual-task cost is much smaller if the tasks do not involve maintaining bound feature representations . Taken together, these experiments not only resolve a discrepancy in the field and clarify how to assess the dual-task cost but also indicate that capacity can be constrained both by modality-specific and modality-independent sources of information processing.

Keywords: memory, capacity limits, dual task

I.WHAT THE RESEARCH SHOWS

For the human brain, there's no such thing as over the hill. Psychologists researching the normal changes of aging have found that although some aspects of memory and processing change as people get older, simple behavior changes can help people stay sharp for as long as possible.

Although researchers are still piecing together what happens in a healthy aging brain, they can explain some typical changes. Noted cognitive psychologists such as Fergus Craik, PhD, and Timothy Salthouse, PhD, have been investigating what happens and compiling the results, as well as trying to improve the methodology of this growing field of research.

To understand what happens on the outside, it's important to know what happens on the inside. The brain's volume peaks in the early 20s and gradually declines for the rest of life. In the 40s, when many people start to notice subtle changes in their ability to remember new names or do more than one thing at a time, the cortex starts to shrink. Other key areas also show modest changes. Neurons (nerve cells) can shrink or atrophy, and there's a large reduction in the extensiveness of connections among neurons (dendritic loss). The normally aging brain has lower blood flow and gets less efficient at recruiting different areas into operations.

As the brain changes, so does behavior. And so, given that blood flow drops the most in the frontal cortex, people most commonly experience declines in verbal fluency, or the ability to find the words they want. They also have to work harder at "executive function," planning and organizing their activities. The areas most affected after that include the parietal cortex, which affects construction and visuomotor performance (practice that golf swing!), and the medial temporal area, which affects the ability to make new long-term memories and think flexibly.

Using neuroimaging and increasingly sensitive psychological tests, researchers have refuted the model that people, as they get older, go into a general mental decline. Instead, psychologists are developing a model of specific deficits that show very different rates of decline and also vary widely among individuals. They also suspect that middle-aged sensitivities about memory loss may be exacerbated by comparisons with one's youthful performance. It may be more realistic to compare one's performance to healthy age-matched peers instead.

Psychologists are building evidence for a consistent pattern of change. Episodic (what did I have for breakfast?), source (where did I learn about that new car?), and flashbulb (where where you on Sept. 11, 2001?) memory decline the most. Semantic (words, facts and concepts) and procedural ("it's like riding a bicycle - you never forget") memory decline the least. Storage capacity is not the issue; the brain is not an overloaded hard drive. Rather, the changes appear to come in how people encode and retrieve information. Interference, such as distraction, blocks encoding more and slower processing may hurt retrieval, such as being able to remember names and dates. Still, even with these subtle changes, most older adults still seem to efficiently acquire new information and park it in long-term memory. And implicit learning - learning without conscious effort - seems to more or less be spared into old age.

Can anything be done for older adults who start showing signs of memory problems? New evidence on what can be done to keep older minds fit is demonstrated in psychologist Michael Marsiske's research. Challenging oneself by learning a new language or playing a new musical instrument may be a solution to preventing memory problems or the development of dementia or Alzheimer's. From a study called Advanced Cognitive Training for Independent and Vital Elderly (ACTIVE), which Marsiske co-directed with other psychologists (Karlene Ball, George Rebok, Sherry Willis) and non-psychologists, and with funding from the National Institute on Aging and the National Institute of Nursing Research, Marsiske and colleagues found that short mental workouts improved performance and was sustained even five years later. In the study, approximately 2,800 volunteers were assigned to one of three training conditions (trained participants received instruction in one of three different kinds of thinking skills: memorizing lists, reasoning [looking for patterns in strings of numbers or letters] and visual concentration.) and a condition where no training occurred.

All trained participants received a baseline of ten hours of instruction. Half of the trained participants received an extra eight hours of "booster" training. Five years later, compared to untrained controls, the participants in each training group still showed a significant performance advantage on learned thinking skills. Furthermore, participants receiving booster training showed even more significant benefit in the areas of reasoning and visual concentration. In addition, there was evidence that training "transfered" to real world skills. Participants in all three groups reported fewer limitations in performing tasks of daily living than the participants in the no training group. The participants in the reasoning-trained group showed the most improvement. And, in the area of visual concentration, participants who received eighteen hours of training (booster training group) were compared with those who received the basic ten hours of training, blind observers found that booster participants were significantly quicker at speeded everyday activities, including accurately reading instructions on medicine bottles, finding items in a pantry, or reacting to road signs on a computer.

II.WHAT THE RESEARCH MEANS

First, scientific insight into memory helps researchers and clinicians distinguish between normal age-related changes and the warning signs of serious cognitive impairment. That distinction is essential as more of the population moves into the age bracket associated with higher rates of mild cognitive impairment, often viewed as a precursor to Alzheimer's disease. Second, viewing memory change as a collection of specific and only subtle changes may help erase the gloomy stereotype about "losing it" with age. That can yield multiple benefits. For one thing, reducing anxiety will help people to learn and remember more efficiently. Researchers also have found that when people think they can do it, a concept known as self-efficacy, they perform better. For another, employers familiar with the facts may be more willing to recruit, hire, retain and retrain older workers.

III.HOW WE USE THE RESEARCH

Understanding the neural basis of memory has fostered techniques and programs to help older adults adjust to normal age-related changes. First, it's important for people in middle-age and up to relax, knowing it's okay to write to-do lists and organize their living spaces (keys by the door!) to support their changing memory. Second, rehabilitation experts are sharing expertise with people who want to improve function even if they haven't experienced an actual brain injury. Memory devices such as mnemonics, routines, visualization, linking new learning to something personally meaningful, and other strategies can boost memory. The greatest gains come from combining memory skill training with cognitive restructuring - in other words, accepting normal age-related changes and actively compensating for them.

IV.CONCLUSION

Finally, a healthy lifestyle supports brain health. Regular aerobic exercise has been shown to aid cognition, probably because it boosts blood flow and brings more oxygen to the brain. Although objective evidence about the benefits of mental exercise remains limited, certainly it does no harm. Anecdotally, many older people still report that pursuing new intellectual challenges and enjoying a supportive social network helps them stay sharp. In retirement, people stay mentally active in a variety of ways, such as volunteering, learning new subjects, and completing puzzles.

REFERENCES

[1.] Adelson, R. (2005, September). Mending memory. American Psychological Association Monitor.

[2.] Brown, A. S., & Nix, L. A. (1996). Age-related changes in the tip-of-the-tongue experience. American Journal of Psychology, 109, 79-91.

[3.] Caprio-Prevette, M. D., & Fry, P. S. (1996). Memory enhancement program for community-based older adults: development and evaluation. Experimental Aging Research, 22, 281-303.

[4.] Christensen, H., Mackinnon, A. J., Koreten, A. E., Jorm, A. F., Henderson, A. S., Jacomb, P., & Rodgers, B. (1999). An analysis of cognitive performance of elderly community dwellers: individual differences in change scores as a function of age. Psychology and Aging, 14, 365-379.

[5.] Craik, F. I. M. (1994). Memory changes in normal aging. Current Directions in Psychological Science, 5, 155-158.

[6.] Craik, F. I. M. & Salthouse, T. A. (eds.) (2000). The handbook of aging and cognition. 2nd ed. New Jersey: Lawrence Erlbaum Associates.

[7.] Lezak, M. D., Howieson, D. B., & Loring, D. W. (2004). Neuropsychological assessment. 4th ed. Oxford: Oxford University Press.

[8.] Salthouse, T. A. (1994). Age-related differences in basic cognitive processes: Implications for work. Experimental Aging Research, 20, 249-255.

[9.] Salthouse, T. A. (1996). The processing speed theory of adult age differences in cognition. Psychological Review, 103, 403-428.

[10.] Salthouse, T. A. (2006). Mental exercise and mental aging: evaluating the validity of the "use it or lose it" hypothesis. Perspectives on Psychological Science, 1(1), 68-87.

[11.] Smith, A. D. (1996). Memory. In J.E. Birren and K. W. Schaie (Eds.), Handbook of the psychology of aging (4th ed.). San Antonio: Academic Press.

[12.] Small, G. W. (2002). The memory bible. New York: Hyperion.

[13.] Valentijn, S. A. M.; Hill, R. D.; Van Hooren, S. A. H.; Bosma, H.; Van Boxtel, M. P. J.; Jolles, J.; & Ponds, R. W. H. M. (2006). Memory self-efficacy predicts memory performance: results from a 6-year follow-up study. Psychology and Aging, 21, 165-172.

[14.] Verhaeghen, P., Marcoen, A., & Goossens, L. (1992). Improving memory performance in the aged through mnemonic training: A meta-analytic study. Psychology and Aging, 7, 242-251.

[15.] Willis, S.L.; Tennstedt, S.L.; Marsiske, M.; Ball, K; Elias, J.; Koepke, K. M.; Morris, J. N.; Rebok, G.W.; Unverzagt, F. W.; Stoddard, A. M.; Wright, E.; (2006). Long-term effects of cognitive training on everyday functional outcomes in older adults. JAMA, 296 (23), 2805-2814.