The Confounding Influence of Age as an Explanation for Memory Loss Among Older Adult Long Term Care

Contributed by Brian Garavaglia, Ph.D.

Aging is often viewed as the central component behind memory decline found in older adults. Intuitively, it appears quite straightforward; aging leads to memory decline. Yet, when problems in older adult memory happen, is the attribution of the aging process causing these changes a satisfactory explanation? For many the answer is yes, but it is not always that simple or clear.{mosgoogle right}

Although science strives for parsimony, this type of parsimony is far from explanatory. Furthermore, when an older adult enters a hospital, nursing home, or rehabilitation center and memory issues start to surface, is aging again the causative component? What will entail is hopefully a brief, yet informative discussion and response to these questions. The exposition that follows will hopefully demonstrate the need to look at memory issues in the older adult and understand the underlying complexity that exists. All too often clinicians, family members, and laypersons attempt to reduce issues to a level of simplicity that fails to capture the true complexity of the problem. Unfortunately, when this happens, it not only perpetuates older adult stereotypes, but it fails to adequately address memory problems that may be quite correctible.

In examining the data, only approximately 25 percent of the variability is explained by age (Ferrer, Salthouse, McArdle, Steward, & Schwartz, 2005; Schultz & Salthouse, 1999; Sliwinski, Hofer, Hall, Buschke, & Lipton, 2003). This leaves us with a considerable amount of unexplained variance. What this means is that approximately three quarters of change found in older adults’ memory cannot be attributed to age alone. Diagram 1 demonstrates an inner circle, showing that about a quarter of the change in memory can be accounted for by age. However, notice the amount of factors that exist outside of the smaller circle, approximately three-quarters of the factors that play a role in memory change witnessed in the older adult.

What this demonstrates is that as one ages, quite contrary to what many anticipate, it becomes more difficult to isolate these effects of aging. Therefore, determining age and its association with memory is not as clear as most would come to believe. Unfortunately, many associate strict and irreversible causal relationships between memory problems and age, and these mistaken assumptions and errors of reasoning become even more pronounced when one examines nursing homes and mistaken assumptions made by nursing home staff (“Nursing home myths,” 2003; Vann, 2004). In addition, it appears that being more professionally trained does not insulate nursing home professionals from stereotypes, especially as they relate to aging and memory (Hefner, 2001).

It is evident that age does play a role in certain aspects of memory, but when examining the large amount of unexplained variance, one has to look to other areas, especially confounding variables, that are important in explaining memory. For instance, one of the critical areas that needs to be considered is health. The effect of health, or lack thereof, is critical for memory (Chan, Ho, Cheung, & Albert, 2005; DeFrias, Dixon, & Backman, 2003; “A link,” 2003). At all ages, being in poor health can significantly affect memory, and given that older adults typically have more diseases, especially chronic in nature, one can anticipate that these diseases would have significant impact on an older adult’s memory. Diseases such as hypertension, congestive heart failure, or diabetes, diseases that are frequently part of the long-term care environment and often not considered as being related to memory, actually can have a strong impact on memory. Moreover, psychological health may be more important in its implications for older adult memory than physical health, especially given the level of depression found among nursing home residents (vanHooren et al., 2005).

Other Confounding Factors on Aging Memory

Older adults typically use more medication than other age groups. The average older adult uses four to five medications daily, and those within nursing homes average double that amount (Ferrini & Ferrini, 2000; Merck Manual of Health and Aging, 2004; Wooten & Galavis, 2005). For instance, blood pressure and pain medication are very common among this age group. Although both are important for addressing medical conditions in later years, they can also have important and pronounced effects on memory. For example, many blood pressure medications can cause lethargy, as well as slightly altering states of consciousness and memory, and these mild alterations may hold significant results for memory in older adults. Even many medications that are sold over the counter, especially for cold and allergy symptoms, may produce anticholinergic effects, which can lead to memory problems, especially among older adult members.

Associated with the polypharmacy issue above is the biological changes that happen as we age. Medications have to be specially tailored to the age and the level of debilitation in the person. However, most drugs continue to be tested on younger populations with dosage recommendations that are based on more youthful trial participants (Steinmetz, Coley, & Pollock, 2005). The pharmacokinetic effect, such as the metabolism of the drug(s) in the liver and elimination and excretion of the drug(s) from the kidneys, is usually reduced with age (Estelle & Simons, 2002; Health and Medicine Week, 2005). What this entails is that medications may stay longer in the body and the same strength medication used on the younger population may also have an increased effect on older adults. Along with this issue is the likelihood for medication interaction, which increases with the more medications that are used. Here again the potential of multiple

medication use and reduced metabolism of the medication can accentuate the likelihood for pharmaceutically induced cognitive problems and memory issues in the older adult.

Nutrition may have an important impact on memory as well. Although nutrition is often taken for granted, it has been estimated that as many as 10 to 25 percent of the older adult population is malnourished (Ferrini & Ferrini, 2000). Although caloric intake is often reduced with older age, an important nutritional balance still needs to exist (Consumer Reports on Health, 2003; USA Today, 2005; Walsh, 2002). Not having an appropriate intake of certain vitamins, minerals, fatty acids, proteins, and carbohydrates can and does affect memory, and with the level of potential malnutrition found among older adults, especially within long-term care settings, this is an important consideration that needs to be examined as it relates to memory. Even hydration is an important nutrition consideration (Ritz & Berrut, 2005). Many elderly people may not be receiving adequate hydration within long-term care settings, leading to memory problems.

Depression can also be instrumental in memory problems. Depression in the elderly often goes unrecognized because of stereotypes associated with this age group (Ferrini & Ferrini, 2000). With younger individuals, one of the cardinal signs of depression is problems with memory. Yet, among older adults, this becomes overlooked and associated with “normal aging.” Furthermore, depression in older adults will demonstrate different presentations that when coupled with anxiety and the stereotypes of aging, make it a formidable challenge to diagnose (“Depression is different,” 2005; Smallbrugge, Jongenelis, Pot, Beekman, & Esfsting, 2005). Depression can be another confounding feature that is too frequently not addressed or failed to be viewed as playing a critical role in memory loss among older adults.

Before leaving this topic, the influence that stress has upon older adults and their memory has to be mentioned. Not all stress is negative, and although individuals of all ages experience stress, enduring and unremitting stressors can have a pronounced effect on memory. Furthermore, movement into a long-term care facility is often a very stressful experience for many older adults. Stress hormones often accompany the stress response, and some of these stress hormones have negative effects on memory, especially in the retrieval of information (Newcomer et al., 1999). James McGaugh (2000) found that increased glucocorticoid levels such as cortisol, a specific hormone released during stress, has profound implications for memory. The higher the glucocorticoids in the blood, the greater the memory impairment that was found. Moreover, higher stress hormones such as cortisol, sustained over a period of time as the result of prolonged stress, have a neurotoxic impact on the cells in a critical brain region called the hippocampus, potentially leading to cell death. As a result of cortisol’s toxic impact on the hippocampal region of the brain, impairment in memory, especially with the consolidation and retrieval of information, is common. (Sapolsky, 1992; Sapolsky, 2001; Sapolsky, 2004). This may help explain why so many older adults, after being admitted to long-term care facilities, start to demonstrate memory problems. It may not be that the older adult “just started to go senile,” but rather that the stress of the new residence or placement into such a facility has created a significant level of stress, subsequently leading to memory problems from the stress response. Summary

There are other variables that could further be delineated as playing critical roles in the unaccounted variance found among aging memory. However, this list should provide an important account of many variables that can confound studies of older adult memory and make it difficult to isolate the effects of aging and memory in exclusivity from these other variables. For sure, attributing age as the sole source of memory disturbance is often too simple an explanation. Furthermore, a vast amount of memory loss is simply not explained by just the single variable of age. However, it continues to be used by many in society, in health care, and in particular, long-term care, to explain the deterioration of memory. Memory loss or disturbance is frequently associated with age and becomes an easy heuristic to use as a causative explanation. However, as has been shown in this article, age is neither a necessary, nor sufficient cause for explaining most of the variance in memory problems found among the elderly. Hopefully this article will help to bring about a greater holistic evaluation of older adults and issues related to memory in long-term care and prevent cursory diagnoses of age-related cognitive changes or dementia to be reached out of convenience without any appropriate supporting evidence. References

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Brian Garavaglia, Ph.D., is a gerontologist in Michigan with interests in dementia, delirium, and depression, especially within long-term care. He has worked as a long-term care administrator and ethicist, and teaches at colleges in the Detroit metropolitan area.
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