Strategies and Factors That Help or Hinder Memory

“Is there anything I can do to improve memory?” Subjective memory complaints, and pleas to improve it, are common in healthy older adults and patients in memory clinics alike, with some estimates of prevalence of concern about memory function being as high as 50% (Jonker, Geerlings, & Schmand, 2000). Indeed, “dementia worry” is a common source of health anxiety (Commissaris et al., 1996), rivaling that associated with developing cancer. Many studies, however, have demonstrated that cognitive change is not unitary and that some memorial abilities decline more rapidly than others (Park et al., 2002). More recently, there has been a greater appreciation of the way in which individuals differ in their rates of cognitive change (Bastin et al., 2012) and in the possibility that aging adults could overcome deficits, or inconsistency, in their cognitive performance. Emerging theories are suggesting that the degree of age-related cognitive decline is malleable (Garrett, MacDonald & Craik, 2012; Park, Gutchess, Meade, & Stine-Morrow, 2007; Willis et al., 2006). In this issue of The Journal of Gerontology: Psychological Sciences, we highlight a trio of studies examining evidence on the nature of cognitive decline, stressing the variability in individual responses to aging, and the factors that can help or hinder performance.

First, Hutchens et al. (2013) examined the role of self-efficacy: an individual’s beliefs regarding their ability to produce an outcome, as well as how one’s viewpoint regarding the controllability of memory, link to strategy use as a means to improve memory. The classic work of Bandura (1977) and the more recent work of Borkowski, Carr, Rellinger, and Pressley (1990) have implicated these factors in the degree to which one is willing to engage and persist in coping behaviors that enable application of effort on challenging tasks, which facilitate memory encoding. Importantly, Hutchens et al. consider how these factors affect the acquisition and transfer of memory strategies and whether the relationship applies equally to those seniors with amnestic mild cognitive impairment (aMCI). Previously, Miller and Lachman (1999) proposed a theoretical framework such that strategy use mediated the relationship between control beliefs and memory performance; perceived (or actual) decline in memory ability reduced one’s sense of control, and this subsequently decreased engagement in strategies to aid memory, as well as task effort. The end result is a vicious circle in which memory performance gets compromised, thereby further reinforcing the reduction in control beliefs. Hutchens et al. wanted to examine this relationship in normal aging compared with aMCI individuals with an aim to determine whether the model might provide a useful framework for interventions to aid older adults with significant challenges in memory processing.

Not surprisingly, aMCI participants reported a weaker sense of control over their memory. Interestingly, strategy use in healthy older adults significantly, but only partially, mediated the relationship between control beliefs and memory performance. As such, although manipulating control beliefs may help to improve strategy use and ultimately memory performance for healthy older adults, a multifactorial approach is likely necessary to make considerable gains in performance. Notably, using path analysis, Hutchens et al. also showed that this relationship existed only in healthy, but not aMCI, individuals. In this group, strategy use did contribute to predicting memory performance, but there was a minimal relationship between control beliefs and memory performance and between an interaction of control beliefs, strategy use, and memory performance in the aMCI group. Such research highlights that a focus on interventions that increase strategy use in this population will lead to the biggest gains in performance.

As in the Hutchens et al. study, another study within this issue by Yang, Chen, Ng, and Fu (2013) investigated how strategy use can enhance memory. In particular, Yang et al. examined the benefits of categorization and sorting of information during encoding. What is novel here is that they investigated whether culture, Western versus Eastern, plays a significant role. Literature on cross-cultural differences in cognition suggests that categorization, as an information processing and organization strategy, is more often used by aged Westerners than by East Asians (Gutchess et al., 2006). Americans prefer to sort stimuli by shared features or category (i.e., taxonomic categorization), whereas Chinese are more likely to group stimuli by interdependence and relationships (Ji, Zhang, & Nisbett, 2004). Cross-cultural research has suggested that people of Western cultures are more skillful at taxonomic categorization than those of East Asian cultures (Nisbett, 2003; Nisbett & Masuda, 2003). Although previous work showed cultural differences in categorical clustering during free recall of words (Gutchess et al., 2006), it was unknown whether any cultural differences would appear in memory for stimuli artificially sorted into distinct and mutually exclusive taxonomic categories.

In the Yang et al.s’ study, a North American sample was shown to outperform Chinese in memory for categorically processed information, and notably the effect was more pronounced for older than for young adults. Using two different memory tasks, Yang et al. showed that indeed both...
intentional source memory for a set of faces and incidental reality monitoring of words showed a benefit for aged Western populations and a reduction in age-related performance decline. It appears that the accrued years of cultural experience and lifelong practice of culturally favored cognitive strategies, such as grouping, sorting, and classifying, benefit performance on certain memory tests. Whether such strategy use can be readily learned and applied even without lifelong cultural influences remains to be determined.

We also know of other strategies or factors that can enhance memory. One of these involves self-referencing (Hamami, Serbun, & Gutchess, 2011). Referencing the self is known to enhance accurate memory. However, much less is known about the flip side of such a strategy; that is, could it affect false memory? Although self-referencing facilitates accuracy for target and related items, there could be a downside. The exact mechanism that functions to enhance memory may also increase the likelihood of false alarms! As suggested by the implicit associative model of memory (Roediger & McDermott, 1995), the deeper processing resulting from self-referencing as an encoding strategy also enhances associations with the self-referenced information, which subsequently can lead to greater false memory for these associated, activated items. The end result is that individuals may experience intrusions from these associations during retrieval of target information. Of course, the more associations are activated, the stronger the associations become and the greater the likelihood that intrusions might occur. Such an increase in false memory would mitigate any potential benefits in memory for highly self-relevant words, particularly in older adults already prone to an increase in false memories (Dehon & Brédart, 2004; Roediger & McDermott, 1995).

In Rosa and Gutchess’ (2013) study, they make use of the frequency mirror effect that tells us that low-frequency, or highly distinctive, words produce higher hit rates and lower false alarm rates compared with high-frequency words, which produce lower hit rates and higher false alarm rates (Glanzer & Adams, 1985; Reder, Angstadt, Cary, Erickson, & Ayers, 2002). In Rosa and Gutchess’ (2013) study, words judged to be less common should have higher hit rates and lower false alarm rates. In contrast, they tested whether higher hit and false alarm rates would occur for words rated as highly, than less, self-descriptive. In the critical comparison in the Rosa and Gutchess study, self-referencing as an encoding strategy selectively increased false alarms, especially for older adults when information was highly self-relevant. In their study, it appears that words with a strong connection to the self increased fluent processing and feelings of familiarity, but that this both helped and hurt memory performance.

Clearly, there are benefits for older adults engaging in strategy use, as Hutchens et al. (2013) and Yang et al. (2013) have shown. It is critical, however, to determine the mechanism by which performance is enhanced. As can be seen from the Rosa and Gutchess’ (2013) study, care must be taken to ensure the benefits of a particular strategy outweigh the costs. Future research should examine whether training older adults to use a variety of strategies at encoding can improve net memory performance on different tasks and also whether older adults can apply such strategies to novel tasks and environments beyond the laboratory environment.

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References


