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Cognitive Interventions Among Older Adults

Graham J. McDougall Jr, RN, PhD, FAAN [Associate Professor]

The University of Texas at Austin, School of Nursing, 1700 Red River, Austin, TX 78701,
512-471-7936, gmcDougall@mail.nur.utexas.edu

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This chapter reviews psychoeducational and/or psychosocial interventions designed to improve cognitive function in adults without cognitive impairment. Included are sections on (a) metaanalyses and other reviews, (b) cognitive aging and cognitive improvement, (b) memory training, (c) depression and memory improvement; (d) self-efficacy and aging memory; (e) maintenance of gains and subject retention; (f) comprehensive memory improvement program; and (g) future research. Several aspects of memory training now known to influence outcomes, i. e. memory performance need to be considered in future studies. First, follow-up instruction (booster sessions) facilitate the use of these newly learned memory strategies in elders' everyday lives. Second, elders memory self-efficacy (beliefs and confidence) impacts performance. Third, the inclusion of subjective measures in memory training is recommended. Fourth, greater emphasis on the modification of participants' attitudes toward aging-related memory loss. Fifth, designs must emphasize the long-term outcomes of the memory training. Sixth, establishing a relationship between a memory intervention and functional ability (IADLs) is the next step in assisting older adults to remain independent. If early failure in cognitive ability can be improved through intervention, perhaps early decline in functional independence and the need for formal services, e.g., nursing home placement, can be delayed.

The burgeoning elderly population over 65 years of age in the US some 33 million people as estimated by the 1990 Census--represents one of the biggest challenges facing the nation today in health care. Memory loss is a reality of aging and individuals are known to experience cognitive changes during the age span of 65 to 85 (Rinn, 1988; Schaie, 1989). In laboratory tests, when adults over sixty years of age are compared to twenty year olds, the seniors' performance is lower in free recall, cued recall, and recognition memory for lists of words or sentences. The elders score lower on everyday memory tests with ecological validity as well (Light, 1991). The adult population in general has major concerns about losing their memory, the negative consequences of memory loss, and the reality that memory functioning declines with age (Poon, 1985; Rinn, 1988; Schaie, 1989). Women have a higher risk of becoming mentally frail and/or developing dementia than men, especially at very old ages (Ford et al., 1992; Fratiglioni et al., 1997; McDougall & Balyer, 1998).

The emphasis of this chapter is to review psychoeducational and/or psychosocial interventions designed to improve cognitive function in adults without cognitive impairment.

An intervention may be defined as a programmatic attempt at altering the course of life span developmental phenomena. Interventions may be classified as concrete technologies involving such parameters as the goal (enrichment, prevention, or alleviation), the target behavior (attention, cognition, memory, perception), the setting (family, classroom, community, or hospital), and the mechanism (training, practice, or health delivery) (Baltes & Danish, 1980). Cognitive interventions are designed to change some aspect of cognitive function such as attention, concentration, or memory. These interventions may be applied to many patient or client populations such as the elderly in long-term care and young head-injured individuals in rehabilitation settings. The literature reviewed for this chapter was identified using: (a) ancestry and (b) computerized abstracting services, such as CINAHL, and Psychlit. The review was limited to published referred journal articles in nursing and multidisciplinary sources and no limit was placed on the age of the publication as to not exclude a seminal reference.

Interventions to improve cognitive function have a long history; however it was not until the 1950s that interventions specifically designed to improve the cognitive performance in adults was documented in the research literature. Major conceptual issues include (a) metaanalyses and other reviews, (b) cognitive aging and cognitive improvement, (b) memory training, (c) depression and memory improvement; (d) self-efficacy and aging memory; (e) maintenance of gains and subject retention; (f) comprehensive memory improvement program; and (g) future research.

Numerous investigators have published reviews on interventions designed to improve cognitive performance. The reviews may be broadly classified by the cognitive status of the participant: impaired or intact. The emphases of the reviews are: delirium (Cronnin-Stubbbs, 1996); depression and memory impairment (Burt, Zembar, & Niederehe, 1995); memory performance (Verhaeghen, Marcoen, & Goossens, 1992); and subjective memory functioning (Floyd & Scogin, 1997).

The two meta-analytic reviews of healthy community-dwelling elderly participants indicated that memory training improved memory performance with large effect sizes of $d = .66$ and $.73$, and improved subjective memory functioning with a small effect size of $d = .19$ (Floyd & Scogin, 1997; Verhaeghen, Marcoen, & Goossens, 1992). The overall findings were positive since the elderly benefited more from mnemonic training than from either control or placebo treatments. Treatment gains were negatively impacted as the participants increased in age and as the sessions decreased in length from an optimum 90 minutes. The inclusion of pretraining had a positive impact on memory performance in both analyses. Seventy percent of the sample in the meta-analysis did not include comparisons with a no-treatment control group. Many studies did not include target (sensitive) measures related to the mnemonic strategy taught to participants in the intervention.

Cognitive Aging and Cognitive Improvement

Rowe and Kahn in their 1987 review "Human Aging: Usual and Successful" in the journal Science documented that the effects of the aging process itself have been exaggerated, and the modifying effects of diet, exercise, personal habits, and psychosocial factors

underestimated. Woodruff-Pak in her 1989 review “Aging and Intelligence: Changing Perspective in the 20th Century” in the *Journal of Aging Studies* documented that the research on aging and intelligence can be organized into four distinct phases. In Phase I, emerging in the 1920s and predominating until the 1950s, the view of intelligence and aging proceeded to a steep and inevitable decline. In the Phase II perspective, from the 1950s to the 1960s developed as a result in the contradictions in the research literature between the cross-sectional and longitudinal studies--demonstrating stability in intelligence. The Phase III era dominating until the 1970s illustrated the influence of context in which intelligence is expressed and led investigators to explore new means of measuring different abilities such as fluid and crystallized measures of intelligence in adulthood. In this post-Great Society period of the 1970s interventions to ameliorate intelligence in the aged was undertaken. In Phase IV a rejection of traditional psychometric measures of academic success in favor of competence in the everyday world emerged. This phase also included the search for abilities that develop in adulthood and old age. Contemporary research on aging and intelligence continues to be undertaken from at least three of the four perspectives. The current Phase IV is viewed as the culmination of almost 70 years of research in which positive stereotypes are beginning to become a reality.

National efforts, such as Decade of the Brain from 1990-2000 to study human brain function have relevance for cognitive aging research since there is great variability in memory performance in aging (Subcommittee on Brain and Behavioral Sciences, 1989). Therefore, learning more about the processes of aging memory and the methods to improve memory performance in older adults is crucial. Mortimer's (1997) review “Brain Reserve and the Clinical Expression of Alzheimer's Disease” in *Geriatrics* hypothesized how findings from studies of older non-demented individuals, who have plaques and tangles to meet diagnostic criteria for Alzheimer's disease during life, may have greater brain reserve which buffered the clinical expression of the disease. Three types of brain reserve were examined. First, the number of neurons and/or the density of their interconnections in youth. Second, the collection of cognitive strategies for solving problems and taking neuropsychological tests. Third, the amount of functional brain tissue remaining at any age. His conclusions that approximately one-third of individuals meeting neuropathologic criteria for AD are not demented prior to death which encourages the view that while the disease may not be preventable, its clinical expression is likely susceptible to intervention, such as early-life nutrition, prevention of cerebrovascular disease, and intellectual stimulation.

Memory Training

Memory Training.

Treatment for memory complaints in normal healthy elderly persons takes two forms. The most frequent intervention is to simply tell the individual, “Don't worry, there is nothing wrong with you.” This advice is rarely heeded and the person continues to seek help or silently remains concerned. The second approach is for the older adult to attend a memory training program designed to improve memory performance. Participants are taught to use mnemonic devices, which are learning strategies that may enhance their learning and future recall of information. A mnemonic strategy can be defined as any mental strategy or

technique that aids the learning of one material by using other, initially extraneous, material as an aid to such learning.

Early research on intellectual training in aging individuals has provided support for ongoing research into modifying older adults' cognitive abilities (Plemons, Willis, & Baltes, 1978; Willis, Blieszner, & Baltes, 1981). Studies show that older adults have a substantial reserve capacity in their fluid intelligence and that training may activate cognitive skills already available in their repertoire (Baltes, Kliegel, & Dittmann-Kohli, 1988; Kliegel, Smith, & Baltes, 1989).

Cognitive aging research indicates that the elderly are interested in memory improvement techniques, but often are at a loss as to how to acquire and implement these skills in their daily lives (McDougall, 1994). Older adults tend to become more dependent on external memory strategies and rely less on their own thinking and remembering ability (Herrmann & Petro, 1990). The use of cognitive strategies has been shown to improve memory performance. These strategies are broadly classified as internal (effort, elaboration, and rehearsal) and external (calendars, lists, and place) (McDougall, 1995a, c). When given appropriate instructions, older adults are capable of using both internal and external strategies to noticeably improve their memory performance.

Memory training programs for older adults usually rely on the teaching of mnemonics, defined as any mental strategy or technique that aids the learning of the desired material by using other, initially extraneous, material to aid learning and future recall (Bellezza, 1981; Brown & Deffenbacher, 1975; Roberts, 1983; Yesavage, 1985). Investigators have recommended that the memory improvement training be multi-factorial and go beyond simply teaching one or two mnemonic strategies (Stigsdotter Neely & Backman, 1993a, b; Stigsdotter Neely and Backman, 1995; West, 1989). Because mnemonic strategies are often seen as useful only for classical episodic memory tasks, older adults may have problems and difficulty in transferring the use of these strategies to their everyday lives. Simply teaching mnemonics to elders has no relationship to their everyday memory performance. Older adults often encounter great difficulty transferring mnemonic strategies into their daily lives when mnemonics are the major emphasis of a unifactorial memory training program, e.g., teaching only one or two mnemonic strategies (Brooks, Friedman, & Yesavage, 1993; Kliegel, Smith, & Baltes, 1990). In previous studies of memory training with older adults, subjects reported on follow-up that they used the memory strategies inconsistently in their everyday lives. For example, Anschutz, Camp, Markley, and Kramer (1987) reported only 10% ongoing use; Hayslip, Maloy, and Kohl (1995) reported 44 and 51%; Stigsdotter Neely and Backman (1993) reported 39%; and finally Scogin and Bienias (1988) reported 28% ongoing use.

Interestingly, these studies indicated that group instruction provided positive effects in the form of mutual support, reinforcement, and enhanced motivation. Also visual imagery and relaxation components persisted rather than mnemonic skills. Memory programs often include training in visual imagery skills to facilitate learning mnemonic devices because it is unusual for older adults to use this technique in their daily lives (Camp et al., 1983; Turnure & Lane, 1987). For example, individuals may be taught to increase the elaboration of details

during the processing of visual-image associations used in a mnemonic device. In one study older adults in the stress inoculation group remembered letter sets learned in the program, but did not remember how to use the mnemonic strategy (Hayslip, Maloy, & Kohl, 1995).

Prototype of a Memory Improvement Study.—The effects of a 4-session group intervention designed to improve metamemory (both knowledge and beliefs), and memory performance in community dwelling elders was tested (Dellefield and McDougall, 1996). The association of depression with memory performance and metamemory was also evaluated. A total of 145 community dwelling older adults ($M=71$ years) participated in the study. The memory program was a 2-week, four-session (1 1/2 hours per class) intervention designed to increase memory awareness and knowledge. Each session included lectures, group exercises, and homework assignments. Topics included: a) how memory serves us, b) factors that affect how people remember, c) techniques for remembering names, d) thoughts and feelings when one forgets, e) normal changes in memory with age, f) how memory works (registering, retaining, and retrieving), g) emphasizing memory skills (self instruction, active observation, making associations, visualization, method of loci, linking, first letter cues, categorization), and h) coping and self-evaluation following memory failures. An important component of the intervention was providing feedback on their overall memory performance. In addition, memory testing during the first session gave the participants feedback about their initial level of memory performance. The memory performance test was readministered during the last session of the intervention to indicate the degree of change. The course content was based on a combination of sources, primarily from published guides for leading a memory course for the elderly.

Metamemory was operationalized with the Metamemory in Adulthood Questionnaire (MIA), a measure of affect, beliefs, and knowledge. For both experimental and control groups, pre-tests (T1) were administered during the first group intervention session, the first post-test (T2) was scheduled on the date of the last session (10 days following the pretest), and the follow-up test (T3) was scheduled for 2 weeks after the last session (approximately 24 days after the pretest). Both the intervention and the control groups took the pretest, the posttest, and the follow-up test at the same time. The intervention significantly improved both metamemory and memory performance in the treatment group ($n=74$). The control group ($n=71$) did not improve; in fact, the control group experienced a significant decline in metamemory scores over time. Memory performance was not significantly related to metamemory. The intervention had no effect on this relationship. Although those individuals with depression who scored a mean of 7.5 as measured by the short Geriatric Depression Scale, had significantly lower metamemory scores than those without depression, there was no difference in memory performance between the depressed and non-depressed subjects. From the post-test (T2) to the follow-up period (T3), depressed subjects receiving the intervention showed a significant decrease in metamemory scores while non-depressed subjects showed no change. The dose of the intervention was not strong enough since subjects had little opportunity to practice in class (enactive mastery experiences). Thus, subjects had enough exposure to memory techniques to see that the techniques could work, but not enough practice to observe actual changes in their memory in everyday situations.

Depression and Memory Improvement

Depression is a significant mental health problem in 15% of the elderly population. Major depressive disorders along with dementia are by far the most serious psychiatric disorders in later life (Blazer, 1990; Fitz & Teri, 1994; Hoch, et al., 1993; Poon, 1992). One review of cognitively impaired adults indicated that depression and memory impairment are associated in studies of recall (N = 99) and recognition (N = 48) (Burt, Zembar, & Niederehe, 1995). These findings should be interpreted with caution since memory impairment is not always linked to depression and the analyses includes only laboratory and diagnostic tests of memory, not tests of everyday memory. Cronnin-Stubbs (1996) reviewed nine studies of delirium in patients in acute care settings and determined that the phenomenon is under diagnosed.

Greater memory complaints have been found with increasing age in depressed individuals than in non-depressed individuals (Lichtenberg, Ross, Millis, & Manning, 1995; McDougall, 1993; Nussbaum & Sauer, 1993). Depression in the elderly has also been shown to be associated with poor memory efficiency and response (West, Boatwright, & Schleser, 1984; Williams et al., 1987). Depression has been found to be a factor in the memory performance of older adults participating in memory training classes (Dellefield & McDougall, 1996; Hayslip, Kennelly, & Maloy, 1990; Scogin, Storandt, & Lott, 1985). However, the relationship between memory complaints and memory performance, and between complaints and affective states are perplexing because complaints are positively related to depression, but inversely related to actual performance (Helkala et al., 1997). Interestingly, one team (Gilewski, Zelinski, & Schaie, 1990) reported that depressed elders were less inclined than the non-depressed to use systematic approaches to recall information, while another team predicted the use of mnemonic strategies more often in the cognitively impaired elderly than in the elderly with depression (Niederehe & Yoder, 1989).

In one community sample of 1,491 older adults, self-reported memory performance was negatively related to depression and cognitive rigidity (Herzog & Rodgers, 1989). On the other hand, in a recent study of 2,495 adult volunteers, age, not depression, was consistently a significant predictor of everyday memory performance, followed by vocabulary and gender (West, Crook, & Barron, 1992). However, depression in these studies was assessed with screening instruments [Center for Epidemiological Studies Depression (CESD), Geriatric Depression (GDS), and Zung Self Rating Depression (SDS) scales] where high scores do not indicate clinical depression. Additionally, the level of depression in these samples was below the cutoff scores for diagnosis of depression.

Self-Efficacy and Aging Memory

Bandura's (1977, 1982) general self-efficacy construct provides a useful explanation for ways that people influence their own motivation and behavior. Perceived self-efficacy refers to the strength of a person's belief that he or she possesses the capabilities to organize and execute whatever courses of action may be required to reach a goal. The influence of self-efficacy may entail regulating one's own motivation, thought processes, affective states, and actions, or it may involve changing environmental conditions, depending on what one seeks to manage (Bandura, 1997). Self-efficacy judgments determine the behavior that is chosen

and affect the amount of effort devoted to a task. Bandura (1997) postulated four principal sources of self-efficacy information: 1) enactive mastery experiences that serve as validators of capability; 2) vicarious experiences that alter efficacy beliefs through transmission of competencies and comparison with the attainments of others; 3) verbal persuasion and allied types of social influences that reinforce the possession of a certain capability; and 4) personal recognition of physiological and affective states that are used in part to judge capableness, strength, and vulnerability to dysfunction. According to Bandura, efficacy beliefs vary across activity domains, levels of demands within the domains, and different environmental circumstances affecting performance. Thus, self-efficacy is task specific and influences one's persistence when difficulties are encountered, e.g. cognitive tasks such as remembering (Bandura, 1993).

Memory self-efficacy is defined as beliefs in one's own capacity to use memory effectively in various situations. Knowledge about memory is distinct from memory self-efficacy. Therefore, it is possible that an older individual may have extensive and accurate knowledge about how memory functions but may also believe that his or her ability to remember in a given context is poor (Hertzog, Dixon, Schulenberg, & Hultsch, 1987). Many older adults have poorer memory confidence than younger adults and this lower memory confidence may have a number of adverse consequences (Bandura, 1989). It is clear that memory self-efficacy beliefs and memory performance are related constructs.

Decreased confidence and weak motivational processes activated by counter productive beliefs may impair memory performance (Cornelius & Caspi, 1986; Lachman & Jelalian, 1984; Luszcz, 1993; McDougall, 1994; Ryan & See, 1993; Seeman, Rodin, & Albert, 1993; Willis & Schaie, 1993). If an individual perceives that memory decreases with age, then he or she is quick to interpret faulty performance as a further indicator of declining memory capacity. Individuals with low confidence may stop trying to remember because of doubts about achieving a desired level of performance. Older adults' beliefs were not emphasized in other training programs but their confidence in their ability to remember had been augmented resulting in an unplanned outcome (Dittmann-Kohli, Lachman, Kliegel, & Baltes, 1991; Hill, Sheikh, & Yesavage, 1988; Rebok & Offerman, 1983). Beliefs were addressed in several memory improvement studies but have been used primarily as a control for memory training, or as a training component without pre- and post-measurements.

In one often quoted study designed specifically to change memory self-efficacy beliefs, the training did not reduce initial age-related performance differences or differences in memory self-efficacy (Rebok & Balcerak, 1989). Correlations between memory self-efficacy and memory performance were not significant, but these findings may be a function of faulty memory self-efficacy operationalization and poor instrumentation. Other studies have not accurately operationalized memory self-efficacy and thus have produced confusing findings (McDonald-Misczak, Hertzog, & Hultsch, 1995). In four studies, however, the memory training course significantly increased memory self-efficacy and memory performance in the short-term, four weeks to three months (Best, Hamlett, & Davis, 1992; Dellefield & McDougall, 1996; Lachman, Steinberg, & Trotter, 1987; Lachman, Weaver, Bandura, Elliott, & Lewkowicz, 1992). Further, perceived self-efficacy predicted memory performance when self-efficacy was measured with questionnaires that ranged from simple to complex.

Therefore, studies designed to improve self-efficacy (memory beliefs and confidence) may be as important as teaching mnemonic strategies (Bandura, 1989; Berry, 1989; Berry & West, 1993).

Maintenance of Gains

The maintenance of gains is a concern for sustaining the effects of a cognitive intervention over time (Stigsdotter & Backman, 1989). Five previous studies reported conflicting findings of the long-term (1 + years) effects of memory training. Anschutz, Camp, Markley, and Kramer (1987) reported on nine of ten original subjects and indicated that while these individuals used the method of loci for remembering a new word list, they did not use this mnemonic to enhance their recall in everyday situations. Scogin & Bienanias (1988) followed 27 of 43 original participants in a self-taught memory training program. The memory training group had a significant decrease in memory performance and a considerable decrease in mnemonic usage over time but no change in memory complaints. Hayslip, Maloy, and Kohl (1995) reported on 108 of 358 original subjects (Assessment at three years post training indicated that use of memory strategies was diminished. After one year Oswald et al. (1996) found that elderly with a mean age of 79 years who participated in a combined memory improvement and psychomotor training program sustained their memory improvement and independent living ability. (Willis and Schaie, 1986; Willis and Nesselroade, 1990) found that with five booster sessions elderly participants (N=25) maintained their fluid ability training over a 7- year period. Since only one study provided booster sessions, or any additional training beyond the initial program, booster sessions may be necessary to reinforce previously learned material, and therefore influence functional ability.

Retention of Subjects.—Previous memory improvement studies had varying levels of subject retention when followed longitudinally. Scogin, Storandt, and Lott (1985) followed 43 original from a self-taught memory training program and reported a 63% retention rate at three years. Anschutz, Camp, Markley, and Kramer (1987) reported a 90% retention on 10 subjects after three years. Willis, Jay, Diehl, and Marsiske (1992) followed 237 members ($\bar{M}$ age = 76.9; $\bar{M}$ education = 12.08 years) of the Seattle Longitudinal Study for seven years with a retention rate of 43%. Hayslip, Maloy, and Kohl (1995) study reported a 30% retention on 358 subjects after three years.

Comprehensive Memory Improvement Program

Cognitive-Behavioral Model of Everyday Memory (CBMEM).—The Cognitive-Behavioral Model of Everyday Memory (CBMEM), a comprehensive model of stress inoculation, health promotion, memory self-efficacy, and memory strategy training was developed to improve, maintain, or prevent decline in the everyday memory of older adults. Although cognitive-behavioral interventions were originally developed and applied to emotionally based disorders (e.g., depression, phobias, impulse control, and evaluation anxiety), several trends in medicine have suggested that cognitive factors are likely to play an important role in all areas along the health-illness continuum. Therefore, cognitive-behavioral strategies are useful beyond their initial focus.

Memory programs for the older adults have usually emphasized two of the four components in the CBMEM model: mnemonic strategies and stress inoculation. A mnemonic strategy can be defined as any mental strategy or technique that aids the learning of one material by using other, initially extraneous, material as an aid to such learning. Mnemonic training may also include visual imagery skills. Imagery procedures have been investigated under the following terms: mental practice, mental imagery practice, mental rehearsal, psyching-up, visuomotor behavior rehearsal, mental preparation, visual imagery, imagery procedures, and covert practice. Usually a visual image is associated with a mnemonic device. For example, individuals can be taught to increase the elaboration of processing of visual-image associations used in a mnemonic device.

Only recently have a few programs incorporated aspects of memory self-efficacy. The argument for using this aspect is that older adults lack a sense of mastery for memory abilities, either because they have observed changes in their own memory or because their culture teaches that memory declines are inevitable. As a result older adults do not try as hard as younger adults to remember. They then remember less, experience reduced feelings of self-efficacy, and so on.

A comprehensive memory training program for older adults must include the four components of stress inoculation, health promotion, memory self-efficacy, and memory strategy training. The CBMEM Model is the first package to address all three of these. Based on Bandura's self-efficacy theory, the CBMEM program includes all four components. When delivered in the right dose, the program increases the individual's belief in their ability to use their memory and this improves their self-efficacy in memory-demanding situations.

Operationalization of Bandura's theoretical sources of self-efficacy.

Bandura (1977, 1982, 1997) postulated four principal sources of self-efficacy information. First, enactive mastery experiences. The curriculum is organized so that the exercises increase gently from less difficult to more difficult. As people begin to feel more competent and comfortable, they will be encouraged to take more risks. Principles of adult learning will be used throughout the program, so that no one will be embarrassed or intimidated in front of the group, and all relevant experience will be discussible. Second, vicarious experiences that alter efficacy beliefs through transmission of competencies and comparison with the attainments of others will be operationalized through the group format and group sharing of the experiences. Third, verbal persuasion and allied social influences to reinforce that one possesses certain capabilities are operationalized through continual feedback on performance accomplishments and encouragement for continued progress. Fourth, physiological and affective states. People tend to feel anxious in situations where competence is questioned. Stress inoculation taught in the pre-training session and practiced in subsequent sessions assists the participants in dealing with stressful situations. Participants are reminded to practice relaxation techniques such as take a few deep breaths at stressful times to alleviate memory anxiety.

The phases of memory improvement may be differentiated as six distinct phases in which participants learn activities and content that is least challenging in the early phases and

progress to most challenging during the final week as CBMEM moves to completion. 1. Modeling Techniques--Participants take part in nonthreatening memory exercises that are fun, enjoyable, and constitute a level playing field for every individual. They utilize their crystallized intelligence acquired through experience and knowledge; no new learning is therefore required to participate. It is simply a rewarding combination of fun and games and the satisfaction of meeting a supported intellectual challenge. The goal of a typical exercise is to identify common names, nouns, and places beginning with different letters given by the instructor. The next more challenging section version is to identify these similar categories of objects when the last letter is given. 2. Observing Their Memory--Group comfort level increases the support needed in this phase. Members of the group learn to realistically assess the strengths and weaknesses of their own memory abilities through vicarious experiences with their colleagues and friends as they observe each other participate and perform. The participants are challenged in an easy interesting fashion. Participants use memory without being tested on new material. 3. Awareness--Participants develop an awareness of attention and concentration and begin to use more complex memory strategies such as association and visualization. Memory exercises as a group allow all members of the class to offer their unique contributions and develop confidence in their abilities through enactment of personal mastery. The group models the ability to self-reflect. 4. Mastery Coping--Participants attend the class which builds their confidence and enjoyment through effective learning experience and overrides any anxiety about potential embarrassment or being called upon to perform beyond their level of confidence and comfort. The participants begin to spontaneously respond to the instructor's general request to participate directly; i.e. say through recalling content discussed at a previous class. 5. Controlled Handling--The instructor calls on specific individuals for participation in memory-demanding tasks. Participants' use of the memory textbook allows controlled access to information since even though an individual may occasionally miss a class, the content is available through reading the book. Participants speak with each other between the classes due to the common bonds that are formed from vicarious and enactive mastery experiences. 6. Suspension--Participants relax their anxieties and defenses and develop the ability to observe themselves and neighbors as they experience memory problems and their solutions, practice relaxation, and use deep breathing in memory-demanding situations thereby facilitating their out-of-the classroom confidence in their ability.

The CBMEM model was tested in three groups of elderly at risk for cognitive impairments: Hispanic community-residing, assisted living, and retirement village. The curriculum was based on a published memory training course "Improving Your Memory: How to Remember What You're Starting to Forget" (Fogler & Stearn, 1994). Each person, except the Hispanic elders, received a copy of the book (English version). The same instruments were used across the three groups for consistency. Cognitive function was assessed with the Mini Mental State Exam (MMSE). Depression was operationalized with the Geriatric Depression Scale. Health status was operationalized by the Health Scale, a subscale of the Multilevel Assessment Instrument (Lawton et al., 1982). Functional ability (IADLs) was operationalized with the Instrumental Activities of Daily Living Scale (Lawton, 1969; 1988). The IADL scale contains a total of eight items: ability to use the telephone, shopping, food preparation, housekeeping, laundry, mode of transportation, medications, and finances.

Metamemory with the MIA (Dixon et al., 1983), Memory Self-Efficacy with the Memory Efficacy Questionnaire (Lachman et al., 1987), and memory performance with the Rivermead Behavioral Memory Test (RBMT).

Hispanic elders.—This study tested the effects of a 4-week, nine-session group intervention taught in Spanish to Hispanic older adults entitled “Quieres Mejorar Tu Memoria” (Do you wish to improve your memory?). The program was based on Bandura’s self-efficacy theory and was designed to increase memory self-efficacy and strategy use (McDougall, 1998). A total of thirty-three older adults with an average age of sixty-nine years, no cognitive impairment, and attending a senior center participated in the study. A booster session and a post-test were given at three months to the intervention group of twenty two elders. At posttest the intervention reported greater confidence in preventing decline in their memories, and in particular greater use of the internal strategy of elaboration, and the external strategies of list and note. This pilot study provides evidence that elderly Hispanics with low education and poverty level incomes can make gains in using memory strategies as well as confidence in their ability to prevent further decline in their memories. Eventhough participants’ overall evaluation of their memories had not changed; they increased strategic behaviors, which boosted their memory self-efficacy and confidence in being able to prevent further decline with age.

Assisted Living Elders.—This pilot study tested the effects of an eight-session, group intervention entitled “MEMORIES, MEMORIES, Can We Improve Ours?” A total of eighteen older adults (13 female, 5 male) participated without cognitive impairment. Participants averaged eighty-one years of age, and had some college, and no depression. Males were significantly more depressed than females. At pretest the experiemntal group rated their overall memory higher than the control group. Posttests were completed one week following the CBMEM intervention. Pearson correlations at pretest were significant for memory performance and memory self-efficacy. Change scores from pretest to posttest were significant for memory performance, memory efficacy, use of internal memory strategies (elaboration and rehearsal), and use of external memory strategies. Since there were large differences in cell size between the experimental and control groups statistical group comparisons were not possible. An issue of great importance is whether the participants are retaining their new learning? There was near perfect attendance in class. The class had greater pre and post test scores than the average scores of older adults reported in established normative studies.

Retirement village.—This study tested the effects of a 4-week, eight-session group intervention, the Cognitive-Behavioral Model of Everyday Memory, derived from Bandura’s Self-Efficacy Theory, in which older adults learned the skills necessary to improve, maintain, or prevent memory decline, and change negative or stereotypical beliefs about cognitive aging. A total of 78 older adults (58 females, 20 males) participated with an average MMSE score of 28. Dependent variables included memory performance measured by the Rivermead Behavioral Memory, memory self-efficacy by the Memory Efficacy Questionnaire, and Instrumental activities of daily living scale. There were no differences between experimental and control groups on the demographic variables of age, education,

depression, and health. Overall males had significantly more years of education (16.34 vs. 14.58) than females, $p=.0538$. The experimental intervention was dismantled into two components: X 1 and X 2. Treatment 1 was the 8-session CBMEM course with the published memory book given on the first day of the class to each participant. Treatment 2 was the book given to participants four weeks before completing the 8-session CBMEM program. There were 31 subjects in X 1, 19 in X 2, and 28 in the wait-list control group. Pretesting occurred over a 3-day period so that the three groups were separated. Posttests (T2) for X 1 were completed 41/2 weeks following the CBMEM intervention. Posttests (T2) for X 2 and control groups were completed within the week following the completion of the first CBMEM intervention over a 2-day period so that the three groups were temporally separated. Posttests (T3) for X 2 and wait-list control groups were completed within 1-week after completing the second CBMEM intervention. The control group scored significantly higher on memory achievement than experimental group 2. In the experimental groups there were 31 subjects in Treatment 1 and 19 subjects in Treatment 2 group, and 28 subjects in the wait-list control group. Correlations between depression and memory performance scores were inversely related at pre and post testing. Correlations between memory efficacy and memory performance measures were nonsignificant. In the short-term, the classes boosted memory performance scores, memory confidence, and beliefs about memory. There were no changes in instrumental activities of daily living from pre- to post testing. The wait-list control group achieved significant gains on all outcome measures.

Future Studies

Unfortunately, the Verhaeghen et al., study ignored several important aspects of memory training now known to influence outcomes, i. e. memory performance. First, follow-up instruction (booster sessions) facilitates the use of these newly learned memory strategies in elders' everyday lives. Second, elders memory self-efficacy (beliefs and confidence) impacts performance. Third, the inclusion of subjective measures in memory training is recommended (Floyd & Scogin, 1997). Fourth, greater emphasis needs to be placed on the modification of participants' attitudes toward aging-related memory loss (Floyd & Scogin, 1997). Fifth, studies designed to determine the long-term outcomes of the memory training. Sixth, establishing a relationship between a memory intervention and functional ability (IADLs) is the next step in assisting older adults to remain independent. No study has provided a relationship between an older adult's ability to perform IADLs and the administration of a cognitive intervention designed to improve memory self-efficacy and everyday memory. Studies are needed to determine whether cognitive interventions affect an older adult's ability to perform IADLs. If failure in cognitive ability can be improved through intervention, perhaps early decline in functional independence and the need for formal services, can be delayed. While previous memory training programs have provided strong evidence that older adults can improve their cognitive abilities, at least in the short term, they have not addressed elders' concerns with improving their ADLs and IADLs, nor followed them longitudinally to determine long-term outcomes of the memory training.

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