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Memory Self-Efficacy and Memory Performance Among Black and White Elders

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Abstract

Background: The ability to differentiate between normal functioning and pathologic changes in cognitive aging will be enhanced by descriptive studies providing data from diverse samples of older adults.

Methods: In this study, demographics, depression, health, memory self-efficacy, and metamemory were studied in relation to the memory performance of Black and White American older adults. Community-living adults participated in face-to-face interviews in their apartments or homes. Trained registered nurse interviewers administered all structured questionnaires (subjective) and performance tests (objective), including the Rivermead Behavioural Memory Test. Descriptive statistics, independent sample t-tests, Pearson correlations, and hierarchical regression were used in the analyses.

Results: The sample consisted of 89 Black and 83 White adults (mean age, 76.52 years), and their Mini-Mental State Examination scores were in the nonimpaired range. The memory self-efficacy scores of the entire sample were low ($M = 31.95 \pm 18.20$). The Black elders scored lower on memory self-efficacy and memory performance. Memory self-efficacy predicted memory performance in the White group ($r[83] = .41; p = .05$), but the correlation for the Black group was nonsignificant ($r[89] = .16$). However, when the entire sample was combined for the regression analyses, the relation was significant ($r[173] = .30; p = .05$). Age, education, and memory self-efficacy accounted for 13% of the variance in memory performance.

Conclusions: Objective and subjective memory scores were decreased, and both measures provided insight into the participants' everyday memory function. The sample had low confidence in their memory ability, and this negatively influenced their everyday memory performance. The recruitment of minority elders into cognitive aging studies will continue to challenge researchers.

Keywords

Black elders; depression; metamemory; memory performance; memory self-efficacy

Adults older than 60 years score lower on tests requiring everyday memory (e.g., prose passages, medicine labels, common objects such as coins and telephones, activities performed, names and faces of people) than young adults (Light, 1991; Verhaeghen &

Marcoen, 1993). Older adults are interested in everyday memory such as the day-to-day operations of memory in real-world ordinary situations (West, Crook, & Barron, 1992; Zelin-ski, & Stewart, 1998). Bazargan and Barbre (1992, 1994) found that 52% of Black American elders reported poor memory and forgetfulness, but their actual memory loss may be far worse (Blazer, Hays, Fillenbaum, & Gold, 1997; Whitfield et al., 2000). In another study, after adjustment for age and education, White women were more vulnerable to cognitive deterioration than Black women (Leveille et al., 1998).

Known risk factors for decreased memory performance among older adults include age greater than 75 years, eighth-grade education or less, and socioeconomic status (Herrmann & Guadagno, 1997; Herzog & Wallace, 1997). Less well-known factors influencing older adults' memory performance are beliefs and knowledge about their memory (Berry, West, & Dennehey, 1989; Blazer et al., 1997; McDougall, 1994).

Self-efficacy, a mechanism of personal agency, is belief in one's ability to exercise control over events that affect one's life (Bandura, 1997). An individual becomes efficacious in a particular domain of function through four mechanisms: enactive mastery experience, vicarious experience, verbal persuasion, and physiologic and affective states. Bandura (1997) differentiated "efficacy beliefs" and "outcome expectancies" as follows. An *efficacy belief* is the conviction that one can successfully execute the behavior required to produce the outcomes, whereas *outcome expectancy* is a person's estimate that a given behavior will lead to certain out-comes. Empirical efforts to test self-efficacy in domains of function have rarely included older adults (Bandura, 2001).

Memory self-efficacy was first identified and defined by Hertzog, Hulstsch, and Dixon (1989) and later used by Berry et al. (1989). Memory self-efficacy, a self-evaluative system of belief in one's capacity to use memory effectively in a domain of function (Bandura, 1997), has been associated with memory performance and use of memory strategies (Bandura, 1989; Rebok & Balcerak, 1989). Negatively influenced by anxiety and unchallenging environments, memory self-efficacy decreases with age, and negative beliefs may impair memory performance (McDougall, 1994; Seeman, McAvay, Merrill, Albert, & Rodin, 1996; Seeman, Rodin, & Albert, 1993).

Other subjective evaluations of memory include metamemory. As a self-evaluation of memory, metamemory includes affect, factual knowledge, memory monitoring, and the use of internal and external memory strategies to improve performance (Hertzog, Dixon, & Hulstsch, 1990). Aspects of metamemory may be related to older adults' memory performance, but the findings have been inconclusive (Zelinski, Gilewski, & Anthony-Bergstone, 1990). For example, in a study by Cavanaugh and Murphy (1986), the change subscale of the Metamemory in Adulthood questionnaire predicted memory performance, and in other studies by Cavanaugh and Poon (1989), both the change and capacity subscales predicted performance. However, Hertzog et al. (1990) found that only the capacity subscale predicted performance. Subjective evaluation of memory is important for the everyday activities of older adults.

Self-perceived health predicted the metamemory components of capacity, change, anxiety, and locus in community elders (McDougall, 1994). Older adults with decreased perceived health believed that they remembered less in their everyday lives, that their memories were worse, that they had greater anxiety in memory-demanding situations, and that they were less in control of their memory. Depressive symptomatology is associated with cognitive decline (Paterniti, Verdier-Taillefer, Dufouil, & Alper-ovitch, 2002; Wilson et al., 2002) and generalized complaints about memory function (Grut, Jorm, & Fratiglioni, 1993; Schofield et al., 1997). The percentage of depressive symptoms among White women (26.8%) was twice as great as among Black women (13.8%) (Callahan & Wolinsky, 1994). Similarly, White men had more depressive symptoms than Black men (15.7% vs. 9.3%). However, in other epidemiologic studies of older adults, there were no differences in symptom frequency between Black and White elders (Blazer, Landerman, Hays, Simonsick & Saunders, 1998).

Clearly, the relations among memory beliefs, memory performance, and factors such as depression that may influence these relationships need more systematic examination among the elderly. This study therefore addressed the following research questions:

- Are there racial differences in memory, metamemory, health, depression, and self-efficacy beliefs?
- Is the relation of metamemory to memory performance affected by depression, health, and self-efficacy beliefs?

Methods

Inclusion Criteria

Recruitment included Black and White Americans 70 years of age and older who lived in the community, spoke English, and had no cognitive impairment. A score of 8 or higher on the 10-item Short Portable Mental Status Questionnaire (SPMSQ) indicated no cognitive impairment (Folstein, Folstein, & McHugh, 1975). The 10-item SPMSQ is easily administered over the telephone. It is scored so that one more error is allowed if an individual has less than an eighth-grade education, and one less error is allowed if an individual is educated beyond high school. In addition, one more error is allowed for Black subjects, using identical educational criteria. This study followed the recommended protocol.

Procedure

An elaborate telephone-screening plan was developed to avoid causing undue anxiety and stress for those who were perhaps ineligible because of early or mild cognitive impairment. A computer-generated random zip code list of adults from Cuyahoga County, Ohio, 70 years of age or older was purchased, and a four-phase telephone-screening plan was followed. At the first telephone call, eligibility was determined by the question "Is there a Black or White individual in the household 70 years of age or older?" If the answer was "yes," identified individuals were asked during a second call whether they were interested in participating in a study of memory and health. If the person was interested, a flyer describing the study was mailed to the house. During a third call, if interest was affirmed over the telephone, a nurse

research assistant administered the SPMSQ with verbal consent. The individual then was thanked for participation and mailed a \$2 grocery coupon. During a fourth call, eligible individuals were informed that they qualified for a complete home interview. At that time, if they were interested, their address was confirmed and an interview was scheduled (McDougall, Holston, & Wilke, 2001).

Sample

Of the total random sample contacted during the third telephone call, 529 individuals were administered the SPMSQ over the telephone. Of those screened, 243 (46%) made no errors, 153 (29%) made one error, and 90 (17%) made two errors. Therefore, 43 (8%) of the individuals recruited by random sampling methods were disqualified for potential cognitive impairment because they made three or more errors on the SPMSQ. The sample deemed eligible for participation in an in-home interview consisted of 486 individuals. The final sample contained 172 individuals (355 chose not to participate). The majority of the sample ($n = 108$, 63%) was recruited by random methods. The remainder ($n = 64$, 37%) were recruited by convenience methods.

The losses of potential participants were greater among Black Americans because during the four recruitment calls, a major change in the sampling method was instituted and Black Americans were recruited through convenience sampling and snowball methods. Black Americans were recruited with no difficulty by methods that involved face- to-face contact with members of the research team (McDougall et al., 2001). In such cases, none declined to participate. A total of 62 participants were recruited in this fashion, resulting in a sample of 89 Black Americans.

Before the interviews, the letter of consent was read and questions were answered. Participating individuals then were given the Mini-Mental State Examination (because the SPMSQ administered by telephone is not always capable of detecting mild cognitive impairment). Designed to determine the severity of cognitive impairment, the Mini-Mental State Examination (Folstein, Folstein, & McHugh, 1975), contains 11 questions, with scores ranging from 0 to 30. A score of less than 23 indicates cognitive impairment. All the participants in this study scored 23 or higher.

Next, demographic data and data on medications were collected, and the memory self-efficacy, metamemory, and depression instruments were administered. The memory performance timed test, a health questionnaire, and the prospective memory items from the last part of the memory performance test were administered. The duration of the interview process averaged about 2 hours. Most participants finished the 20-minute memory performance test in 10 minutes, which allowed them a short break.

Respondent burden, if observed, was considered a barrier to completion of the interview in one session. Burden was assessed through a number of measures such as direct questioning and observation of participant fatigue indicators (e.g., restlessness, inattention, drowsiness, and agitation). There also was a potential for error if elders responded to questionnaire items in what they perceived to be a socially desirable manner. These influences were muted partially through interviewer training by the principal investigator.

Instruments

Metamemory—Metamemory was measured with the Metamemory in Adulthood Questionnaire, which consists of 108 statements, with responses rated on a 5-point Likert scale. Independent subscales measured achievement, anxiety, capacity, change, locus, strategy, and task (Hertzog et al., 1989). *Achievement* is the perceived importance of having a good memory and of performing well on memory tasks. *Anxiety* is the respondent's rating of the influence that anxiety and stress have on performance. *Capacity* is the perception of memory capacities, as measured by a predictive report of performance on given tasks. *Change* is the perception of memory abilities as generally stable or subject to long-term decline. *Locus* is the individual's perceived personal control over remembering abilities. *Strategies* reflect the knowledge of one's remembering abilities such that performance in given instances is potentially improved. This knowledge includes the reported use of mnemonics, strategies, and memory aids. *Task* is a knowledge of basic memory processes, especially the knowledge of how most people perform. The Cronbach alphas for the seven subscales with this sample ranged from .65 to .87.

Memory Self-Efficacy—Memory self-efficacy was assessed with the Memory Self-Efficacy Questionnaire. Based on Bandura's self-efficacy theory (Berry et al., 1989), this instrument is a Guttman scale consisting of 50 questions: 5 for each for 10 daily tasks, with five levels of response ranging from least difficult to most difficult for each question. The everyday tasks are groceries, telephone, picture, location, word, digit, map, errands, photographs, and a maze. Subjects rate their self-efficacy for each of the five task levels on a scale of 1 to 5, and their strength and confidence (SEST) in performing each task using a percentage range of 10% to 100%. Coefficients of reproducibility level ($r = .88$) and strength ($r = .95$) have been reported with community elders (Berry et al., 1989). Alpha reliability for this sample was .96.

Depression—Depression was measured with the Center for Epidemiological Studies Depression Scale (Radloff & Teri, 1986). This instrument has four subscales: depressed affect, wellbeing, somatic symptoms, and interpersonal relations. Individuals respond to the items on a 4-point Likert-type scale using a range of responses from "rarely or none of the time" to "most or all of the time." Scores may range from 0 to 60, with higher scores indicating more depressive symptoms. A score of 16 or higher is considered to be in the depressed range. This instrument has been tested with older Black, White, and Mexican American adults and found to be stable when subscale and total scores are reported (Callahan & Wolinsky, 1994). Alpha reliability for this sample was .82.

Memory—The Rivermead Everyday Behavioral Memory, designed to reflect everyday memory performance, served as the memory performance measure (Cockburn & Smith, 1989; Wilson, Cockburn, Baddeley, & Hiorns, 1989). The components of this instrument assess the remembering of a name (first and surname), a hidden belonging, an appointment, a picture, a brief news article, a face, a new route (immediate), a new route (delayed), a message, an orientation, and a date. Each task is set up so that normal participants will pass and individuals with memory difficulty will fail. For each subtest, two scores are produced: a pass/fail screening score and a standardized profile score with possible choice options of 0

(abnormal), 1 (borderline), and 2 (normal). Thus each participant's evaluation results in two scores: a screening score ranging from 0 to 12 and a standardized profile score ranging from 0 to 24. For the current sample, the alpha reliabilities were .66 for the standardized profile score and .59 for the screening score.

Health—The Medical Outcomes Study Health Scale (SF-36), a measure of self-rated health including overall health, functional status, and well-being was used to measure health (Ware & Sherbourne, 1992). The SF-36 includes eight concepts: (a) limitations in physical activities because of health problems, (b) limitations in social activities because of physical or emotional problems, (c) limitations in usual role activities because of physical health problems, (d) bodily pain, (e) mental health (psychological distress and well-being), (f) limitations in usual role activities because of emotional problems, (g) vitality (energy and fatigue), and (h) general health perceptions. Individuals respond to 36 items on a Likert scale with a range from “poor” to “excellent” and from “much worse” to “much better.” Construct validity has been determined (McHorney, Ware, & Raczek, 1993). Alpha reliabilities for the current sample ranged from .72 to .90.

Results

The participants' education ranged from 3 to 25 years ($M = 11.67 \pm 3.20$), and their ages ranged from 70 to 93 years ($M = 76.52 \pm 5.15$). Findings showed that 98 individuals lived alone (57%), 53 lived with a spouse (31%), 2 lived with a companion (1%), 13 had other living arrangements (8%), and 6 individuals had no data (3%).

Racial Differences

Independent sample *t*-tests were calculated between the Black and White groups for all the study variables. The White group had significantly more ($p = .001$) years of education ($M = 13.07$ vs. 10.35) and scored higher on the Mini-Mental State Examination ($M = 28.22$ vs. 26.71) than the Black American group. There were no age differences between the groups. The White group scored significantly higher than the Black group ($p = .05$) on the health variables of role emotional, mental health, and physical function. There were no group differences in the remaining health variables (Table 1). The scores on the Center for Epidemiological Studies Depression Scale showed great variability, with 28 individuals (16%) scoring in the depressed range (>16). A two-tailed Pearson's χ^2 analysis indicated that significantly more Blacks than Whites scored in this range ($\chi^2[4, N = 172] = 7.24; p = .008$).

On the metamemory questionnaire, scores on the subscales of anxiety, total strategies, internal strategies, external strategies, and task scores differed significantly ($p = .05$) between the groups (Table 2). The Black participants had significantly greater memory-related anxiety than the White participants (3.19 vs. 2.98). Also, the Black elders reported using significantly ($p = .05$) fewer memory strategies (3.21 vs. 3.51) than their White counterparts (Table 2). In addition, the Blacks scored lower on the task scale (3.67 vs. 3.91).

There were significant group differences in memory performance, as measured by the Rivermead Everyday Behavioral Memory (Table 3). The Blacks had lower standard profile

scores (16.87 vs. 18.40) and lower memory screening scores (7.19 vs. 7.98). The memory self-efficacy scores also differed significantly ($p = .01$) between groups, with Blacks scoring lower (28.98 vs. 35.13).

Correlations

In the total sample, memory self-efficacy was positively associated with memory performance ($r[173] = .30$) (Table 4). Memory self-efficacy predicted memory performance in the White group ($r[83] = .41$; $p = .05$), but the correlation for the Black group was nonsignificant ($r[89] = .16$). However, when the entire sample was combined for the regression analyses, the relation was significant ($r[173] = .30$; $p = .05$). In the entire sample, memory self-efficacy also was associated with education (.22), cognition (.28), capacity (.40), and change (.31). Memory self-efficacy was inversely related to anxiety ($- .33$) (Table 5). The metamemory variables of capacity ($- .36$), change ($- .46$), and locus ($- .26$) were inversely related to memory anxiety. However, anxiety and strategy (.23) were positively associated. Task was positively associated with cognition (.25) and education (.37). Depression and anxiety were positively associated (.38).

Regressions

Hierarchical regression analyses were conducted to study the added effect of memory self-efficacy on memory performance after control was used for demographic variables, depression, and metamemory (Table 5). The regression model included the entire sample. To avoid a confounding effect with depression, the SF-36 subscales were not entered into the regression model. The order of entry into the regression models was determined by variables' ability to predict memory performance, as reported in the literature. In the first regression model, age and education were entered, and they accounted for 9% of the variance in memory performance. Both were significant. In the second model, age and education were included along with memory self-efficacy, depression, and the metamemory factors of achievement, anxiety, capacity, change locus, strategy, and task. After the demographic, metamemory, and depression measures were entered into the equation, the memory self-efficacy significantly increased the prediction of memory performance (F change = 9.69; $p = .01$). Memory self-efficacy increased the contribution to performance by 4%, but this was the only significant ($p = .01$) additional predictor besides age. Together, age and memory self-efficacy accounted for 13% of the variance in memory performance. The regressions for each variable are presented in Table 6.

Discussion

In this cognitive aging study with noncognitively impaired Black and White elderly, an objective measure of memory performance and subjective measures of memory self-efficacy and metamemory were included. The study had two major limitations. First, the sampling methods varied by race. Black participants were recruited by random sampling methods and convenience sampling methods. In contrast, the White participants were recruited by random sampling, with two participants recruited by convenience sampling. Second, the testing instruments were complicated and administration required 2 to 3 hours. This may have

produced biased responses. The most difficult aspect of the study was the recruitment of Black elders, who did not respond well to telephone recruitment.

According to the Rivermead Everyday Behavioral Memory scores, the older adults in this study scored lower on memory performance than participants in other studies (Cockburn & Smith, 1989; Ponds & Jolles, 1996). In the MacArthur study of successful aging, age did not predict memory performance in either the Black or White American groups (Whitfield et al., 2000). However, age has predicted performance in numerous other studies (Verhaeghen & Marcoen, 1993; Zelinski & Stewart, 1998). Years of education were positively related to everyday memory performance. Researchers investigating cognitive aging have not agreed that race predicts cognitive function, but they have argued that a combination of age, education, and socioeconomic status may intervene (Blazer et al., 1997; Herzog & Wallace, 1997). This finding may have particular relevance for minority elders who may be fearful of cognitive or mental disorders, and who often have less formal education than their White counterparts (Bazargan & Barbre, 1992, 1994). The White elderly had more years of education, higher cognitive function, and less depression than the Blacks and these differences may have contributed to the differences in memory performance.

As compared with other samples of older adults, the participants in this study had low memory self-efficacy scores (McDougall, 1994). Memory self-efficacy has predicted memory performance in numerous studies with White elders (Berry et al., 1989; Best, Hamlett, & Davis, 1992). In this study, however, memory self-efficacy predicted memory performance in a sample of Black and White elders with no cognitive impairment. It has been noted that low memory self-efficacy can occur with highly difficult tasks, unfamiliar tasks, or familiar everyday memory activities, including simple memory tasks (West & Berry, 1994). The memory testing in this study was novel, unfamiliar, and difficult. Therefore, given the lower educational attainment of the Black participants, as compared with that of the White participants, the low scores on self-efficacy are not surprising. It has been shown that White elders' beliefs about memory performance can be modified and improved through intervention, but whether minority elders can change their beliefs about cognitive aging has not been determined (Best et al., 1992; Lachman et al., 1992; McDougall, 1999, 2002).

In this study, the Black participants had greater memory-related anxiety than the White participants, and anxiety was inversely associated with memory self-efficacy. However, the score on the anxiety subscale of the Metamemory in Adulthood questionnaire showed no relation to memory performance. The explanation for greater memory anxiety among the Black Americans may be related to their lower memory self-efficacy scores. Two self-efficacy experiments illustrated the reciprocal nature of self-efficacy and anxiety. Bandura, Reese, and Adams (1982) and Bandura, Cioffi, Taylor, and Brouillard (1988) demonstrated that variable levels of experimentally induced self-efficacy produced more positive coping and greater performance attainments. As self-efficacy levels rose, individuals experienced progressively less anticipatory and performance distress while coping with threats. The confirmatory nature of these experiments involved not only a physiologic measure of opioid activation, but also valid and reliable psychometric instruments. A global measure of anxiety

may have stronger predictive ability than a domain-specific measure of memory-related anxiety.

The Metamemory in Adulthood questionnaire offers a valid assessment of older adults' attitudes, beliefs, and use of strategies to facilitate remembering in everyday situations. However, in this study, as in several other studies, none of the seven metamemory subscales predicted memory performance (Ponds et al., 2000; Zelinski et al., 1990). The metamemory subscales did provide additional information about everyday memory performance. For example, differences in strategy use and task know-how were positively associated with education, and clearly placed the Black elderly at a disadvantage. There were no group differences in achievement, capacity, change, or locus. The White elders scored higher on task, but this was clearly associated with education level. Older adults tend to use external strategies such as lists and notes more often than internally generated memory strategies such as elaboration and rehearsal to facilitate remembering (Burack & Lachman, 1996; Hermann & Guadagno 1997). In this study, the Black participants used fewer total memory strategies to facilitate remembering in their day-to-day lives than the White elderly.

In this study, depression scores were significantly higher in the Black group, and they also scored lower on physical functioning, role emotional, and mental health. However, the scores of the Blacks on other health scales did not differ from those of their White counterparts. These findings are in conflict with the results from the Callahan and Wolinsky (1994) study, in which both White men and women had more depressive symptoms than Black men or women. Investigators (Grut et al., 1993; Schofield et al., 1997) have found that depression predicts treatment noncompliance and memory impairment. The findings from the current study may have implications for day-to-day adherence to medical treatments. Although the relation between memory performance and depression was nonsignificant, the differences in depression scores between the Black and White groups may have clinical significance for maintaining the independence of vulnerable and frail older adults.

The findings from this study indicate that memory self-efficacy and memory performance are related in White elders, but not in Black elders. Memory self-efficacy predicted memory performance in this mixed racial sample of community-dwelling older adults. Whether negative beliefs about cognitive aging can be changed in diverse samples of older adults is not known. The high incidence of depression among the Black American participants was an unexpected finding and suggests that all older adults need to be evaluated routinely for depression. This also was recommended recently by the U.S. Preventive Services Task Force (Pignone et al., 2002). Continued investigation of cognitive aging in real-world contexts with diverse samples of older adults is essential for health promotion and maintenance of functional ability in this population. ▼

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TABLE 1.
Means and Standard Deviations of Demographic and Health Variables

	Black (<i>n</i> = 89)		White (<i>n</i> = 83)		<i>t</i>	<i>P</i>	<i>d</i>
	<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD</i>			
Age (years)	76.33	5.19	76.73	5.12	-.52	NS	
Education (years)	10.35	2.79	13.07	3.03	-6.13	.01	
MMSE	26.71	2.19	28.22	1.83	-2.79	.01	-.42
Depression	10.04	8.64	7.05	6.37	2.60	.01	.40
Physical functioning	55.22	27.98	68.07	27.78	-3.02	.03	-.46
Role physical	60.67	41.95	69.88	38.80	-1.49	NS	
Bodily pain	68.35	26.56	73.80	25.13	-1.38	NS	
General health	57.06	20.25	62.89	22.23	-1.80	NS	
Vitality	57.98	24.55	59.28	21.60	-.37	NS	
Social functioning	80.62	26.65	86.45	24.40	-1.49	NS	
Role emotional	77.90	34.80	91.16	23.33	-2.95	.04	-.45
Mental health	79.60	17.46	84.92	14.44	-2.18	.03	-.33

Note. NS = not significant; MMSE = Mini Mental State Exam.

TABLE 2.

Means and Standard Deviations of Metamemory Variables

	Black (<i>n</i> = 89)		White (<i>n</i> = 83)		<i>t</i>	<i>p</i>	<i>d</i>
	<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD</i>			
Achievement	3.75	.33	3.70	.39	1.06	NS	
Anxiety	3.19	.56	2.98	.53	2.37	.02	.36
Capacity	3.11	.49	3.13	.52	-.19	NS	
Change	2.60	.56	2.65	.56	-.61	NS	
Locus	3.46	.47	3.43	.54	.43	NS	
Strategy	3.21	.61	3.51	.55	-3.43	.01	-.52
Task	3.67	.30	3.91	.31	-5.05	.01	-.77

Note. NS = not significant.

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TABLE 3.
Means and standard Deviations of Memory Performance and Memory Self-Efficacy Variables

	Black (<i>n</i> = 89)		White (<i>n</i> = 83)		<i>t</i>	<i>P</i>	<i>d</i>
	<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD</i>			
Memory performance—SS	7.19	2.12	7.98	2.14	-2.18	.05	-.41
Memory performance—SPS	16.87	3.86	18.40	3.32	-2.79	.05	-.42
Memory self-efficacy	28.98	17.27	35.13	18.74	-2.24	.05	-.34

Note. SS = XXX; SPS = XXX.

TABLE 4.

Correlation Matrix for Study Variable ($N = 172$)

	1	2	3	4	5	6	7	8	9	10	11	12
1. Age												
2. Education	-.12											
3. Cognition	-.16*	.30*										
4. Depression	.07	-.21*	-.14									
5. Memory SE	-.12	.22*	.28*	-.12								
6. Memory	-.25*	.22*	.45*	-.03	.30*							
7. Achieve	.03	-.02	.02	.00	.09	-.02						
8. Anxiety	.08	-.14	-.05	.38*	-.33*	-.14	.16*					
9. Capacity	-.05	.05	.02	-.09	.40*	.05	.14	-.36*				
10. Change	-.16*	-.16*	.01	-.20*	.31*	.12	-.02	-.46*	.63*			
11. Locus	-.10	-.14	.05	-.19*	.15*	.03	.38*	-.26*	.32*	.42*		
12. Strategy	-.02	.22*	.19	-.01	-.14	.07	.21*	.23*	-.22*	-.23*	.10	
13. Task	.03	.37*	.25*	-.08	.12	.15*	.15*	-.05	-.02	-.17*	.01	.33*

Note. SE = XXX.

*
p .05.

TABLE 5.
Summary of Hierarchical Regression Analysis for Variables Predicting Older Adults' Memory Performance ($N=172$)

Model	Unstandardized Coefficients			Standardized Coefficients			Adjusted Significance		
	<i>B</i>	<i>SE</i>		β	<i>t</i>	Significance	<i>R</i> Square	<i>F</i> Square	Change
1	(Constant)	27.55	4.25		6.48	.01			
	Age	-.16	.05	-.23	-3.12	.01	.10	0.9	.001
	Education	.22	.08	.19	2.63	.01			
	(Constant)	22.94	6.69		3.43	.01			
	Age	-.16	.05	-.22	-2.89	.01			
2	Education	.18	.10	.16	1.84	.07	.13	.08	.642
	ACH	-6.20	.88	-.01	-.07	.95			
	ANX	-.63	.62	-.10	-1.00	.32			
	CAP	-.39	.72	-.05	-.54	.59			
	CHG	.88	.71	.14	1.24	.22			
	LOC	-.13	.69	-.02	-.19	.85			
	STR	.21	.53	.03	.40	.69			
	TSK	1.31	.95	.12	1.37	.17			
	DEP	4.03	.04	.09	1.04	.30			
	(Constant)	23.57	6.52		3.61	.01			
3	Age	-.15	.05	-.20	-2.76	.01			
	Education	.12	.10	.10	1.19	.24			
	ACH	-.35	.87	-.03	-.40	.69			
	ANX	-.34	.61	-.05	-.56	.58			
	CAP	-.87	.72	-.12	-1.21	.23			
	CHG	.74	.70	.11	1.06	.29			
	LOC	-.10	.68	-.01	-.15	.88			
	STR	.40	.52	.06	.76	.44			
	TSK	1.07	.93	.09	1.15	.25			
	DEP	3.55	.04	.08	.94	.35			
MSE							.18	.13	.002

Dependent variable: SPS_{*g*}

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TABLE 6.
Summary of Hierarchical Regression Analysis for Variables Predicting Older Adults' Memory Performance (N=172)

Model	Unstandardized Coefficients			Standardized Coefficients		Adjusted Significance		
	B	SE	β	t	Significance	R Square	F Square	Change
1	(Constant)	27.53	4.24		6.49	.01		
	Age	-.16	.05	-.23	-3.13	.01	.10	.09
	Education	.22	.08	.19	2.63	.01		
2	(Constant)	23.57	6.51		3.62	.01		
	Age	-.15	.05	-.20	-2.78	.01		
	Education	.12	.01	.10	1.19	.24		
	MSE	5.25	.02	.26	3.11	.01	.18	.13
	CESD	3.52	.04	.07	.93	.35		
	ACH	-.35	.87	-.03	-.40	.69		
	ANX	-.34	.61	-.05	-.56	.58		
	CAP	-.87	.72	-.12	-1.21	.23		
	CHG	.74	.70	.11	1.06	.29		
LOC	-.10	.68	-.01	-.15	.88			
STR	.40	.52	.06	.76	.45			
TSK	1.07	.93	.01	1.15	.25			

^aDependent variable: SPS.