
COGNITIVE FUNCTIONING AMONG AFRICAN AMERICAN OLDER ADULTS

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Introduction

It has been well documented that certain cognitive abilities decline as a function of the aging process, including episodic memory, processing speed, and inhibitory control. The rate at which episodic memory and speed of processing change as a function of age is dependent upon a number of variables including health, education, and occupational complexity (Avolio & Waldman, 1994; Cagney & Lauderdale, 2002; Hiltunen, Keinanen-Kiukaanniemi, & Laara, 2001; Stewart & Liolitsa, 1999). All of these factors vary as a function of ethnicity. Yet there has been little research investigating the trajectory of cognitive changes as a function of ethnicity. Most of the studies have focused on Caucasian, middle class, well-educated older adults (Marcopulos, McLain, & Giuliano, 1997). Cognitive functioning among older adults is extremely important because it determines the extent to which older adults can be independent (Zsembik, Peek, & Peek, 2000), and it impacts their emotional well being (Bazargan & Bazargan, 1997).

The current contribution will review research that focuses on cognitive functioning among elderly African Americans. First, there will be an overview of the relationship between health and cognitive functioning among African Americans. Second, there will be a discussion of findings from current studies, with special emphasis on the problems with cognitive and neuropsychological assessment of older African Americans. Third, there will be a discussion on dementia.

Health and Cognitive Functioning

The literature is replete with evidence that there is a relationship between health and cognition, especially with regard to major diseases such as diabetes and hypertension (Akiyama et al., 1997). Unfortunately, African Americans suffer from hypertension at 1.6 times the rate of whites (American Heart Association, 2003) and diabetes at approximately twice the rate of whites (Brancati, Kao, Folsom, Watson, & Szklo, 2000). Further, hypertension, in particular, insidiously affects cognitive functioning. Few people realize that hypertension not severe enough to trigger a stroke can result in the gradual accumulation of sub-clinical lesions in the brain over a period of years. There is even evidence that chronic hypertension can result in atrophy of the brain (Akiyama et al., 1997). One study (Knopman et al., 2001) examining the relation between cardiovascular disease (CVD) risk factors (e.g., hypertension) and cognitive functioning over a six year period found that cognitive changes were greater for

middle-aged and older participants suffering from hypertension than for people free of vascular disease in the same age group, although the investigators qualified their findings by indicating that the changes were small and probably not clinically significant among the middle-aged participants.

Investigators have found similar cognitive impairments among individuals suffering from diabetes. Initially it was assumed that diabetes-related cognitive decline occurred because of the association between diabetes and cardiovascular disease (Cosway, Strachan, Frier, & Deary, 2001; Stewart & Liolitsa, 1999). However, recent studies have found that diabetes contributes to cognitive decline independent of hypertension or cardiovascular disease, especially with regard to verbal memory. In fact, there is even evidence that diabetes leads to an accelerated aging of the brain (Cosway et al., 2001).

Thus, because of the high incidence of diabetes and hypertension in the black community, African Americans may be at greater risk for cognitive decline than their white counterparts. African Americans are also at risk for experiencing cognitive decline because of special stressors in their lives (Din-Dzietham, Nembhard, Collins, & Davis, in press). There is evidence that stress is related to cognitive functioning (Patel & Finch, 2002) and that African Americans face more stressors than their white counterparts (Din-Dzietham et al., in press). One of the ways in which stress has a deleterious effect on cognition is through the release of cortisol. Short-term release of cortisol results in arousal and temporary improvement in cognitive functioning. However, long-term release leads to a number of untoward effects including atrophy of the hippocampus and the medial prefrontal cortex (Erickson, Drevets, & Schulkin, 2003), which lead to a number of cognitive impairments including deficits in verbal and visuospatial abilities. There needs to be more exploration of the cognitive functioning of healthy older African Americans. For example, longitudinal studies need to be conducted to determine if health problems such as hypertension result in African American older adults experiencing cognitive decline earlier than whites.

Current Research Findings

Due to the effects of institutional racism, African American older adults often lack the protective factors that may offset the risks for cognitive decline. Institutional racism refers to collective action by government agencies or organizations to discriminate (often covertly) on the basis of race (Kershaw, 1992). Institutional racism has indirectly affected the cognitive functioning of older African Americans by limiting access to education and intellectually challenging employment (Galloway, 1994).

To explain further, a number of researchers have provided evidence that people with more education perform better on cognitive measures than their age-matched peers. In fact, the well-educated are less likely to experience dementia or age-associated cognitive impairment (Arbuckle, Gold, & Andres, 1986; Aviolo & Waldman, 1994; Wright, Aneshensel, Seeman, & Seeman, 2003; Zsembik & Peek, 2001). There has been historical institutional racism with regard to education; African Americans for generations have received less funding for education and have had a lower quality of education (Bullock III & Rodgers Jr., 1976; Galloway, 1994) than their Caucasian counterparts.

Another factor that protects against cognitive decline is intellectually-stimulating employment. Being involved in an occupation that is intellectually stimulating allows one to maintain cognitive abilities longer and serves as a protective factor from dementia (Fritsch, McClendon, Smyth, & Ogrocki, 2002; Scarmeas & Stern, 2003). However, once again, African Americans have been less likely to have access to intellectually stimulating occupations because of institutional racism. That is, there has been collective action by employers and even the government to discriminate on the basis of race, thus preventing African Americans from entering intellectually stimulating professions (Bullock III & Rodgers, 1976). Many highly intelligent African Americans have been menial laborers because they have been denied access to positions commensurate with their intellectual abilities (Bullock III & Rodgers, 1976).

All of the aforementioned conditions would lead one to predict that African American elders might be more vulnerable to cognitive decline than their white counterparts. What does the empirical evidence suggest? Most of the studies have reported that African American older adults score lower than their white counterparts on assessments of cognitive functioning. For example, Moering, Schinka, Mortimer and Graves (in press) found that African Americans scored lower on a test that assesses the ability to focus on relevant information and ignore distracting irrelevant information in the environment. Zsembik and Peek (2001) found that African American older adults scored lower on a test battery that assessed attention and episodic memory. Likewise, Brown, Schinka, Mortimer and Graves (2003) found that African Americans scored lower on the modified mini mental status exam, and Manly and colleagues (1998) found that African Americans scored lower than their white counterparts on assessments of episodic memory, language, and abstract reasoning.

Although the racial disparity in cognitive performance is attenuated (Whitfield et al., 2000) and in some instances even eliminated when education is controlled (Grober, Lipton, Katz, & Sliwinski, 1998), a number of studies have found that controlling for health and education does not eliminate racial differences on

neuropsychological tests among older adults (Manly et al., 1999; Whitfield et al., 2000).

Manly and colleagues (1998; 1999) pointed out that there are two reasons that differences in cognitive performance remain for black and white elders after controlling for education. First, due to inequity in educational resources, African American elders who have achieved the same years of schooling as their white counterparts may not have received the same quality of education, and thus may not have achieved the same degree of literacy (Manly et al., 1999). Second, African American and white older adults have been exposed to widely different cultures.

First turning to the issue of literacy, a number of studies indicate that literacy affects the way participants elaboratively process information (Luria, 1976; Manly et al., 1999). Literate participants are probably more likely to use effective mnemonic devices to remember information than illiterate participants (Bartlett, 1932; Marcopulos et al., 1997). There is even evidence that literacy determines the way the brain organizes verbal information.

Manly and associates (1999) were interested in the relation among literacy, ethnicity, and cognitive functioning. She and her colleagues tested literate and illiterate nondemented older adults who had between 0-3 years of education and found that literacy was more important than education or ethnicity in determining performance on cognitive measures. More recently, Manly and colleagues conducted a longitudinal study to examine if literacy affected the rate of cognitive decline among nondemented elders. They found that, across ethnic groups, literacy served as a protective factor in that decline was much more rapid for the illiterate group than for the literate group (Manly, Touradji, Tang, & Stern, 2003).

As indicated earlier, a second reason that racial differences may remain after controlling for education is that African Americans and European Americans have widely different cultures. Culture includes beliefs, behavior, language ("Culture", Encyclopedia Britannica, 2003), and may even influence cognitive style (Asante, 2003). Most importantly, culture includes values (Kim, Atkinson, & Yang, 1999). One's experiences and values may influence the interpretation of test questions and the type of responses given to such questions. For example in some cultures it is considered impolite to outperform one's peers in a group setting (e.g., the Native American Culture); individuals in a group setting may deliberately miss questions so as not to embarrass other individuals within the group. Thus, these individuals under-perform, relative to their true ability (Cattarinich, Gibson, & Cave, 2001).

One's experiences and culture would also determine familiarity with optimal test taking strategies for standardized tests. Many standardized tests emphasize both speed and accuracy, and thus, the best strategy is to skip unfamiliar questions and

proceed to familiar ones. However, individuals who are unfamiliar with standardized tests would not know that.

Many older African Americans grew up in a culture in which standardized testing was rare. In fact, many African American older adults did not have the opportunity to pursue a high school education. African American older adults are often unfamiliar with testing procedures and the optimal strategies to use to yield the best performance on standardized or neuropsychological tests (Marcopulos et al., 1997). For example, Manly and colleagues (1998) examined the impact of acculturation on neuropsychological test performance. Acculturation was assessed two ways: 1) via the African American Acculturation Scale (Landrine & Klonoff, 1995), and 2) the degree to which participants spoke Ebonics.

The results of the study (Manly et al., 1998) were quite surprising and interesting. When acculturation was not considered, European participants outperformed African American participants on many of the neuropsychological tests. However, after controlling for acculturation, the experimenters found that significant differences were nearly eliminated. One of the measures of acculturation, dialect, has been found in earlier work to affect test performance. For example, Williams and Rivers (1975) found that African American Ebonics speakers had difficulty interpreting questions on standardized tests, primarily due to unfamiliarity with the wording. They found that performance improved when they simply reworded the questions. The work on dialect and test performance is particularly relevant to African American older adults, many of whom were reared in segregated environments speaking a black dialect and may be unfamiliar with the wording of questions on standardized neuropsychological tests (Perez-Arce, 1999).

In addition to culture influencing language, culture may also determine the degree to which certain cognitive processes develop. Asante (1980; 1987) points out that each culture emphasizes certain cognitive capabilities. For example, in contrast to the European culture which emphasizes linear thinking, the African American culture emphasizes holistic thinking, creativity, and social and emotional processing (Asante, 1980; 1987). Several studies have provided evidence that African Americans excel at tasks that involve holistic and relational thinking (Banks, 1988; Hale-Benson, 1990).

The evidence that the African American culture emphasizes different cognitive skills than the European culture is important with respect to neuropsychological testing. People within a culture will hone the skills reinforced by the culture. Moreover, there is even evidence that cultural experience determines the way in which the brain organizes information (Park & Gutchess, 2002). For example, Maguire and colleagues (2000) found that taxi drivers had larger hippocampi in the part of the brain that specializes in spatial location, presumably because they frequently engaged

in route-finding as part of their job. Other researchers have found that postal workers categorize numbers and letters together whereas most individuals do not, presumably because of their experience with street addresses which contain both numbers and letters (Polk & Farah, 1999). Thus, African Americans may organize and process information differently because of their unique experiences. Unfortunately, psychometric tests often reflect the values and skills of the dominant culture and therefore may underestimate the true capabilities of members of minority groups, including African Americans.

Researchers should explore the possibility that African American older adults possess cognitive strengths because of their unique experiences in the African American community. For example, because of the high population density in many African American homes (Boykin & Allen, 1988), many African American older adults have had extensive experience with ignoring environmental distraction. There is some evidence that Caucasian older adults have difficulty becoming habituated to extraneous perceptual information (McDowd & Filion, 1992). Metaphor processing is also emphasized in the African American culture (Asante, 1987). Qualls and Harris (2003) found that when working memory capacity is controlled, older African Americans actually outperform younger participants on tests that measure metaphor processing. At this point, researchers have only begun to examine cognitive functioning among older African Americans. Hopefully, more attention will be devoted to this important topic in the future.

Dementia

The issues of culture and education are vitally important with respect to dementia screening tests, which doctors are increasingly using to diagnose dementia. If the tests are culturally biased, there is the risk that test scores will underestimate African Americans' true functioning and thereby overestimate rates of dementia. In fact, one group of investigators (Welsh et al., 1995) found that dementia screening tests (i.e., the battery included in the Consortium of Alzheimer's Disease) significantly overestimated dementia among African Americans (Froehlich, Bogardus, Jr., & Inouye, 2001).

A number of researchers have been alarmed at the high rate at which African Americans were misdiagnosed as demented and have emphasized the need to develop culturally appropriate tests (Miles, 2001). As a result, researchers have made an attempt to design assessment batteries that are more culturally sensitive and to adjust norms so that they are more culturally appropriate (Norman, Evans, Miller, & Heaton, 2000). For example, the MacNeill-Lichtenberg Decision Tree (MLDT) is a dementia screening tool that was specifically developed to minimize the number of false positives among members of diverse populations. There is evidence that it does a better job than the MMSE (Mini-Mental State Exam) in discriminating between

demented and nondemented African American elderly (Bank, MacNeill, & Lichtenberg, 2000). Researchers interested in dementia are already in the process of developing new culturally-appropriate norms for African Americans test-takers. In addition, several investigators have emphasized the need for dementia screening tests developed specifically for the African American older population (Lamplery-Dallas, 2001; Miles, 2001).

Given the current problems with neuropsychological testing, it is not only difficult to assess patients from minority cultures, but it is also difficult for social scientists to collect demographic information concerning race and dementia. For example, most of the dementia literature reports that African Americans are more susceptible to vascular dementia than Caucasians (Watari & Gatz, 2002). However, the ostensibly higher rates could be due to the cultural bias inherent within the dementia screening tests.

Although much more work needs to be conducted, several innovative studies have made progress in elucidating the relation between race and dementia. For example, one innovative study, conducted by Hendrie and colleagues (2001), compared people of African descent who lived in a Midwestern American city (Indianapolis, Indiana) with people of African descent who lived in Ibadan, Nigeria. The investigators made sure that evaluations and protocols were the same in both countries. Dementia assessments included a structured interview, neuropsychological test batteries, and PET and MRI scans. Test items were slightly modified at both testing sites so that they would be culturally appropriate. Surprisingly, this study found that rates of dementia were higher among African Americans living in Indianapolis, Indiana than among Africans who live in Ibadan, Nigeria. The investigators speculated that African Americans might contract dementia at greater rates than Nigerians because of the greater prevalence of hypertension among African Americans.

Other studies examining the relation between race and dementia have found evidence that the genetic markers for Alzheimer's disease may be different for African Americans than for Caucasians (Miles, 2001). Clearly more research needs to be conducted to examine dementia within the African American population.

Conclusions

Although African American older adults score lower than their white counterparts on neuropsychological tests, these findings are difficult to interpret because of the widely different experiences of black and white Americans. For example, African American older adults have less education and poorer health than white Americans, and both health and education influence cognitive functioning. Further, African Americans differ from their white counterparts with regard to literacy and culture.

The issues of literacy and culture are vitally important with regard to dementia screening, but health care professionals rarely address such issues when assessing older adults from minority cultures. Thus, a high rate of African American older adults may be misdiagnosed as demented.

It is hoped that, in the future, culturally sensitive neuropsychological tests will be developed. It is also hoped that research will be conducted to specifically address pressing issues that relate to race and cognition among African American older adults.

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