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A Comparison of Self-Rated and Objectively Measured Successful Aging Constructs in an Urban Sample of African American Older Adults

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Abstract

Sixty-seven ($N = 67$) urban African American older adults were divided into successful and unsuccessful aging groups based on objective MacArthur (i.e., physical and cognitive functioning) and on self-rated health criteria. Only 30% of the sample met objective MacArthur criteria for successful aging compared to 63% who rated themselves as successful. Self-rated successful aging was best predicted by regular exercise, whereas objective successful aging was best predicted by demographic characteristics and cognition. Reading ability mediated the relationship between both education and cognition to objectively defined success. Finally, objective successful aging was related to quantity and quality of education, whereas self-rated successful aging was related to a wider variety of variables. Defining successful aging on objective factors alone may limit our understanding of successful aging in urban African American older adults.

Keywords

African American; education; cognition; construct validity; successful aging

Traditional definitions of successful aging include objectively defined criteria. Rowe and Kahn (1997) defined successful aging in terms of: absence of disease/disability; high physical and cognitive functioning; and active engagement with life. One of the largest attempts to study objective successful aging using this framework was the MacArthur Studies on successful aging (Berkman et al., 1993), which used physical and cognitive cutoff scores to distinguish these groups. Overall, 32.6% of their sample met successful

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aging criteria, whose members performed better on cognitive and physical tests, rated their own health better, and reported fewer chronic health conditions. Notably, those in the nonsuccessful groups were less likely to be educated and White, a finding that has been replicated by others (Strawbridge, Cohen, Shema, & Kaplan, 1996).

Other studies have used physical and cognitive cutoff criteria similar to the MacArthur studies. For instance, Andrews, Clark, and Luszcz (2002) classified 36% of their sample as successful, and found that lower age, higher education, more physical activity, and better health behaviors were significant predictors of group membership. Similarly, Jörm et al. (1998) divided individuals aged 70 and older into three aging groups based on physical and cognitive criteria and found that successfully aging individuals were community dwelling, reported good or excellent self-rated health and no ADL disability, and achieved a MMSE score of 28–30.

Some controversy has emerged regarding the use of Rowe and Kahn criteria for successful aging. For instance, while absence of chronic conditions is a component of successful aging per Rowe and Kahn, even in the MacArthur sample, the successful group still had 1.2 chronic conditions—a finding that stands in contrast to Rowe and Kahn's model. Strawbridge, Wallhagen, and Cohen. (2002) found that 16.7% of individuals who rated themselves as successful had 3 or more chronic conditions. Therefore, consistent with findings from the MacArthur sample, presence or lack of chronic conditions did not appear to have as strong an influence on self-appraisals of success so much as it did on a nomothetic approach to successful aging.

Additionally, controversy over the use of cutoff criteria on cognitive tests has emerged. For instance, Strump, Monahan, and McHorney. (2005) suggest The Short Portable Mental Status Questionnaire (SPMSQ) used in the MacArthur criteria is sensitive to age, education, and race. Whitfield et al. (2000) found that African Americans in the MacArthur sample, in contrast to Caucasians, were at an overall disadvantage in that they had two years less education, poorer self-rated health, and named 1.5 fewer items on a confrontation naming task. Because of the role of quantity and quality of education in cognitive test performance and interpretation (Bank, MacNeill, & Lichtenberg, 2000; Strump, Monahan, & McHorney, 2005), consideration of these factors in minority elders in the context of successful aging is important. Moreover, Schafer Johnson, Ficker, and Lichtenberg (2006) found that WRAT-3 Reading, a measure of quality of education, in older African Americans was highly related to cognitive test scores. In this way, reported years of education alone may not adequately capture important information about quality of education. Taken together, African Americans may be at a distinct disadvantage with respect to achieving successful aging, particularly when objectively defined criteria are the basis for this determination.

In an effort to understand more about the unique contribution of subjective indicators of successful aging, Strawbridge, Wallhagen, and Cohen (2002) divided individuals into successful and nonsuccessful groups based upon their responses to: 'I am aging successfully (or aging well).' In contrast to the results found in most objective studies of successful aging, Strawbridge and colleagues found that 50.3% considered themselves successful by self-ratings, whereas only 18.8% met objective success criteria. This trend was true for both African Americans (45.8%) and Caucasians (50.6%) who were more likely to consider themselves aging successfully compared to objective classification (8.3% and 19.1%, respectively). Tate, Lah, and Cuddy (2003) conducted a qualitative analysis using a person-centered approach to defining success, and found that happiness, enjoying life, and having a satisfying lifestyle were all associated with success beyond physical and mental health. Bryant, Corbett, and Kutner (2001) similarly found that physical health was defined more in terms of being and remaining active, rather than the absence of disease or disability.

Each of the above studies has used different criteria to define success, rendering it challenging to both define and draw conclusions about successful aging across studies. However, a large-scale review of successful aging found the extant literature on this topic has been varied, using a multitude of variables but have largely found that health behaviors, illness, and subjective health are generally related to successful aging (Depp & Jeste, 2006). Nevertheless, most studies of successful aging either do not report the racial or ethnic profile of the sample (e.g., Andrews et al., 2002) or use only Caucasian samples (Vaillant & Mukamal, 2001). Thus, little is known about successful aging in racial or ethnic minorities, particularly African Americans.

The present study seeks to explore and compare self-rated and objectively measured successful aging in an urban sample of African Americans. It is hypothesized that: (1) a greater percentage of this sample will rate themselves as successfully aging as compared to those who meet objective criteria, consistent with previous findings from the literature; (2) self-rated successful aging will be related to modifiable health behaviors, whereas objective success will not; and (3) the relationship between objective successful aging and cognition will be mediated by quality of education.

METHODS

Participants

Data for this study were drawn from the SAGE (Stress and Success in Aging through Good Health and Executive Functioning, 2004) dataset, containing data on 100 community-dwelling older adults, aged 59 years and older, residing in Detroit. Participants were recruited through flyers and word-of-mouth at community senior centers, churches, and senior apartments in the city of Detroit. Thirty-three individuals were excluded from the analyses because of not being African American ($n=6$) or having insufficient data to make a determination of their objectively measured successful aging status ($n=27$). No statistical differences emerged when comparing those included from those excluded from the analyses. Sixty-seven ($N=67$) individuals were included in this study, with an average of 73 years of age, had attained a 12th grade education, and were primarily women (82.1%). The sample was demographically similar to a population-based city-wide health needs survey in Detroit (Chapleski, 2002).

Procedure

Data were collected in individual interviews, by three trained graduate student interviewers verbally administering measures to each participant. Participants were also given a paper card listing all possible answers in large text format to assist in responding to interview questions. Participants received twenty dollars for their time at the end of the interview.

Measures

CRITERION-DEPENDENT VARIABLES

Self-rated successful aging: Self-rated successful aging was assessed with the following question: In general, how would you rate your overall health? (SF-12; Ware, Kosinski & Keller, 1996). A variety of studies have demonstrated that subjective health perceptions have significant associations with successful aging (e.g., Andrews et al., 2002; Berkman et al., 1993; and Bowling (2006). Krause and Jay (1994) found that self-assessment of health not only related to health problems but also to physical functioning and engaging in health behaviors—concepts related to myriad definitions of successful aging. Further support in the literature has shown that self-rated health is related to a wide variety of constructs, particularly with respect to the notion of “future self” which includes how one anticipates his or her sense of self to be in the future as they age (Bailis, Segall, & Chipperfield, 2003).

In this study, using a paradigm similar to Jörm et al. (1998), those who indicated good, very good, or excellent self-rated health were classified as successful, whereas those who indicated fair or poor health were classified as unsuccessful.

Objectively measured successful aging: Physical performance criteria included achieving standing tandem balance for 10 seconds and completing 5 chair stands in 20 seconds (Guralnik et al., 1995). Additionally, individuals could report a maximum of one IADL (Lawton, 1971) disability (i.e., complete dependence). Cognitive functioning criteria included achieving 24 or more on the MMSE (Folstein, Folstein, & McHugh, 1975; Unversagt et al., 1996) and 10 or greater on Animal Naming (Rosen, 1980; Bank et al., 2000), all validated in the literature for use with older African Americans. Successful individuals in this study were defined as meeting cutoff criteria in all five domains, based on MacArthur criteria.

INDEPENDENT VARIABLES

Sleep: *Pittsburgh Sleep Quality Index (PSQI)* (Buysse, Reynolds, Monk, Berman, & Kupfer, 1989). The PSQI is a 9-item self-report measure that yields a total score ranging from 0 to 21, with scores five or greater classified as poor sleepers. Internal consistency in this sample resulted in a Cronbach's alpha of .67.

Diet: *Seniors in the Community: Risk Evaluation for Eating and Nutrition (SCREEN)* (Keller, Hedley, & Brownlee, 2000). The SCREEN is a 15-item self-report questionnaire that assesses nutritional risk, with total scores ranging from 0 to 60. Scores below 50 are considered nutritional risk. Internal consistency in this sample resulted in a Cronbach's alpha of .49.

Social network: *Multidimensional Scale of Perceived Social Support (MSPSS)* (Zimet, Dahlem, Zimet & Farley, 1988). The MSPSS is a self-report measure of social support, with higher scores indicating a richer perceived social support system. Internal consistency in this sample resulted in a Cronbach's alpha of .86.

Illness burden: *Charlson Comorbidity Index (CCI)* (Charlson, Pompei, Ales, & MacKenzie, 1987). The CCI is a weighted instrument of number and severity of comorbid diseases, yielding a sum score, which is an estimate of death risk. The index was modified to account for the demographics of the current study population: myocardial infarct, ulcers, mild liver diseases, lung diseases, stroke, connective tissue diseases (arthritis), and diabetes were assigned a 1; moderate or severe renal disease and cancer were weighted a 2. Internal consistency in this sample resulted in a Cronbach's alpha of .27.

Emotional health: *Geriatric Depression Scale-15 (GDS-15)* (Sheikh & Yesavage, 1986). GDS-15 scores range from 0 to 15, with higher scores indicating greater depressive symptoms. Internal consistency in this sample resulted in a Cronbach's alpha of .62.

Cognition: *The Trail-Making Test (TMT)* (Reitan, 1992). The TMT-B is a timed task, with higher scores indicating increased difficulty shifting attention, an executive functioning task (Spreeen & Strauss, 1998).

Exercise: engagement in regular physical activity was assessed with the following dichotomously scored question: *Do you regularly engage in exercise?*

Quality of education: *Wide Range Achievement Test-3 (WRAT-3): Reading* (Wilkinson, 1993). WRAT-3 Reading is a test of word familiarity and sight reading ability and is a

measure of quality of education. Schafer Johnson et al. (2006) found a significant association between WRAT-3 Reading score and executive functioning.

RESULTS

Analyses

Cross tabulations of participants who met criteria for self-rated and objectively defined successful aging were compiled, as well as concordance between these two constructs. Chi-square analyses tested for between-group differences. Bivariate correlations between self-rated and objectively defined successful aging and predictor variables were calculated. Finally, logistic regression examined the prediction of self-rated and objectively defined successful aging from Rowe and Kahn variables: high physical (i.e., regular exercise) and cognitive functioning (i.e., TMT-B score), active engagement with life (i.e., MSPSS), and absence of disease and disability (i.e., CCI). In addition, WRAT-3 Reading was added to the model in step 3. The alpha level was set at .025 to minimize Type I and Type II error rates.

Sixty-three percent of this sample rated themselves as successfully aging (i.e., good, very good, or excellent self-rated health). Conversely, 37.3% responded that they were in fair or poor health (i.e., unsuccessful). The difference was significant ($\chi^2(1, N=67)=4.31, p=.038$). In contrast, and using traditional objectively measured criteria, 29.9% of this sample met successful aging criteria, whereas 70.1% of this sample did not meet objective success criteria ($\chi^2(1, N=67)=10.88, p=.001$). As a follow-up to Hypothesis 1, a chi-square analysis to test for concordance/discordance among successful/nonsuccessful categories was conducted. This analysis showed that concordance between objectively measured and self-rated aging revealed 55.2% ($n=37$) agreement and 44.8% disagreement between methodologies for this sample. The majority of this discrepancy ($n=26$) occurred for individuals who rated themselves as successful, but who did not meet objectively specified criteria (38.8%). A very small number of individuals ($n=4$) met objective success criteria, when in fact their self-rated assessment indicated they were unsuccessful (6.0%). Chi-square analysis revealed statistically significant differences ($\chi^2(3, N=67)=15.93, p=.001$). Taken together more individuals rated themselves as successful compared to those who met objective criteria; and there was agreement between the two constructs in approximately half of the sample (Table 1).

Objectively measured aging was significantly correlated with age, reported years of education completed, reading level (i.e., WRAT-3 Reading), illness burden (i.e., CCI), and cognitive processing speed (i.e., TMT-B). Self-rated successful aging was significantly associated with health behaviors, including nutrition (i.e., SCREEN), getting regular exercise, and sleep quality (i.e., PSQI), as well as emotional health (i.e., GDS-15), illness burden (i.e., CCI), and social support (i.e., MSPSS). Neither objectively measured nor self-rated successful aging was significantly associated with gender, BMI, number of alcoholic drinks per day, or current cigarette smoking (Table 2).

Logistic regression analyses (Table 3) revealed that for objective successful aging demographic covariates (i.e., age, gender, and education) entered in step 1 were statistically significant predictors of objective successful aging ($p=.005$), and accounted for 70.8% classification. The addition of Rowe and Kahn variables (i.e., exercise, illness, cognition, and social support) in step two classified a total of 87.7% of individuals ($p=.000$). In the final model, cognition ($p=.020$) and illness burden ($p=.012$) significantly predicted objectively measured successful aging.

In the logistic regression with self-rated successful aging, demographic characteristics were nonsignificant ($p=.168$), although the addition of Rowe and Kahn variables significantly

increased prediction, correctly classifying 84.6% of individuals ($p = .000$). In the final model, illness burden ($p = .009$) and exercise ($p = .006$) were the only significant predictors of self-rated successful aging.

Whether quality of education mediated the relationship between cognition and objectively successful aging relationship was investigated through a series of regressions, as described by Baron and Kenny (1986). WRAT-3 Reading score was significantly related to objective successful aging ($p = .023$) and partially mediated the relationship between Trails B and objectively defined successful aging (Table 4). Thus, cognitive processing speed (i.e., TMT-B) was no longer significantly related to objective successful aging ($p = .073$). A Sobel test was conducted to assess for the significance of the mediation effect, which demonstrated that 65% of the variance between objective successful aging and Trails B was accounted for by reading level ($p = .025$).

DISCUSSION

Nearly two-thirds (62.7%) of this sample of older urban African Americans rated themselves as aging successfully, whereas only 29.9% of the sample met objective successful aging criteria. Importantly, over seventy percent of this sample did not meet the requisite physical and cognitive cutoff criteria for objectively measured success, and thus were classified as nonsuccessful, which is consistent with previous findings (e.g., Berkman et al., 1993; Andrews et al., 2002). Findings from this study provide supportive evidence for the discrepancy between self-rated and objectively defined success. However, more studies examining successful aging in African American older adult samples, as well as other racially and ethnically diverse samples, are needed, particularly studies with much larger samples, which would permit more complex analyses of the variety of factors that impact objective and self-evaluation of successful aging.

A variety of factors may be contributing to the objective-subjective gap in measurement approaches. Perhaps older adults adapt to new situations and their expectations of success (Freund & Baltes, 1998), maximizing their available resources and viewing aging as a dynamic process (von Faber et al., 2001), rather than in terms of meeting specified criteria. This would mean that while they failed to meet objective criteria they were nonetheless achieving their personal self-defined goals and thus in a relative sense judging themselves to be successful agers. A second interpretation is that self-ratings improperly over-estimate successful aging, and that self-perceptions may not necessarily reflect reality (Taylor & Brown, 1988). This interpretation has some support given that 38.8% of this sample rated themselves as successful, but did not meet objective success criteria. However, it is equally plausible that the way individuals interpret the self-rated health question may be a contributor to the confusing picture. This has been called the disability paradox (Albrecht & Devlieger, 1999), and refers to the fact that persons with significant disabilities that impede their daily function may at the same time consider themselves to be in good health. This theory would further suggest that if greater environmental adaptation could be achieved, the more individuals with physical limitations could meet successful aging criteria (Minkler & Fadem, 2002).

This study provides evidence that self-rated successful aging, not objective successful aging, was related to engagement in health promoting behaviors. Specifically, self-rated successful individuals reported significantly better sleep quality, increased physical exercise, less depressive affective functioning, and better nutrition than self-reported unsuccessful individuals, suggesting that both mental and physical health and wellness should continue to be a central concern of any initiative aimed at promoting successful aging. In contrast, objective successful aging was unrelated to these health behaviors. Targeting health

behaviors is a goal for most health disparity strategies for African American older adults (Kocken & Voorham, 1998); and this study provides evidence that in working clinically with older African Americans, increasing mental and physical health promotion programs would be important targets for maximizing successful aging. Recent studies have shown how simple wellness programs with older African Americans can extend participation and promote positive health benefits (Dornelas, Stepnowski, Fischer, & Thompson, 2007; Rodriguez, Bowie, Frattaroli, & Gielen, 2009).

The second major study finding was that, in general, self-rated health was related to a variety of variables, whereas objectively defined success was related to more static features. In qualitative studies on successful aging, multiple factors in combination have consistently been documented as key to older adults' perceptions of successful aging (Montross, 2006). For instance, Phelan (2004) reported that successful aging was related to function, physical, social and psychological health, and that any single feature could not accurately capture the successful aging experience. This research supports the widespread acceptance and continually emerging literature within gerontology that self-rated successful aging is multi-dimensional and needs to be conceptualized and measured as such (Ferri, James, & Pruchno, 2009). Moreover, it supports previous research that suggests self-rated successful aging has a much more robust relationship to modifiable factors than static, mostly demographic factors and unchangeable co-morbid factors. Since so many aspects of the experience of aging can be modified (Vaillant & Mukamal, 2001), i.e., improved, it behooves us to attempt to do so.

The third finding was that the Rowe and Kahn variables provided significant additional predictive power to the logistic regression models, confirming earlier analyses. Cognition was a significant predictor for objectively defined success, whereas exercise was the best predictor for self-rated successful aging. Level and severity of illness comorbidity was significantly associated in both self-rated and objectively rated groups, suggesting that some component of health status may be captured by both paradigms. Moreover, this finding helps explain the relationship between self-rated and objectively defined health reported in previous studies (e.g., Andrews et al., 2002 and Berkman et al., 1993).

The fourth and final result was that quality of education contributes a significant amount of additional predictive power to the regression model, such that when WRAT-3 Reading score is accounted for, TMT-B becomes a nonsignificant predictor of objective successful aging. This suggests that quality of education is mediating the relationship between objective successful aging status and cognition, one of the hallmarks of objectively defined successful aging. Therefore, these data provide initial support that objectively defined successful aging is not related to the maintenance of cognition as purported by Rowe and Kahn (1997), so much as it is to early educational attainment (i.e., WRAT-3 Reading score), especially in an urban sample of African American elders.

While the current study is the first of its kind to document both objective and self-rated successful aging in an African American sample of older adults, there are several limitations related to study procedures and sample size. First, due to a limited sample size ($N = 67$), the results of the current study should be viewed as preliminary. Certainly, similar studies with much larger samples are needed to validate the findings obtained in this study. Second, while there is overlap between self-rated health and self-rated successful aging, the two constructs are not synonymous. Thus, in future studies, a more comprehensive set of successful aging measures could be used. Future research should also examine successful aging from a variety of methodology perspectives; this would include measuring self-rated successful aging through additional methods, such as qualitative assessments, in concert

with quantitative methods. Third, the use of variables to measure cognition was limited, and future studies should use more in-depth cognitive testing.

In summary, self-rated successful aging was related to engagement in health promoting behaviors, whereas objectively defined success was related to more static variables. An important finding was that objectively defined successful aging appeared more related to early educational attainment, rather than maintenance of cognition. Defining successful aging on objective factors alone may limit our understanding of successful aging in urban African American older adults.

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TABLE 1

Concordance and Discordance of Successful Aging Methods

Concordance between successful aging methods.	<i>n</i>	%
Concordance: Successful Aging	16	23.9%
Concordance: Nonsuccessful Aging	21	31.3%
Discordance: Self-rated Success, Objective Nonsuccess	26	38.8%
Discordance: Objective Success, Self-rated Nonsuccess	4	6.0%

Note: $\chi^2(3, N = 67) = 15.93, p = .001$.

TABLE 2

Bivariate Correlations Among Predictor Variables and Successful Aging

Predictor variable	Objective aging	Self-rated aging
Age	-.28*	.18 ^a
Gender	.12	.04
Education	.33**	.13
WRAT-3 Reading	.52**	.15 ^a
CCI	-.33**	-.36**
GDS-15	-.16	-.59** ^a
BMI	-.10	-.11
Alcohol	-.05	-.17
Cigarette Smoking	.06	-.08
PSQI	-.09	-.25*
SCREEN	-.02	.32** ^a
Regular Exercise	.22	.47** ^a
MSPSS	-.09	.24* ^a
TMT-B	-.49**	-.19 ^a

Note: WRAT-3=Wide Range Achievement Test, Third Edition; CCI=Charlson Comorbidity Index; GDS-15=Geriatric Depression Scale, 15-item version; BMI=body mass index; PSQI=Pittsburgh Sleep Quality Index; SCREEN=Seniors in the Community: Risk Evaluation for Eating and Nutrition; MSPSS=Multidimensional Scale of Perceived Social Support; TMT-B=Trail Making Test B.

* $p < .05$.

** $p < .01$.

^a Statistically significant difference between correlations at the .05 level.

TABLE 4

Logistic Regression for Objective Successful Aging with WRAT-3 Reading

Step	Chi-square	df	p-Value
I	12.78	3	.005
Age			.039
Gender			.286
Education			.028
<i>Nagelkerke R² = 0.252</i>			
II	21.96	1	.000
Age			.193
Gender			.201
Education			.298
Illness			.012
Cognition			.020
Physical			.201
Social			.987
<i>Δ Nagelkerke R² = 0.332</i>			
III	5.15	1	.023
Age			.293
Gender			.334
Education			.763
Illness			.014
Cognition			.073
Physical			.370
Social			.904
Reading Level			.038
<i>Δ Nagelkerke R² = 0.063</i>			

Note: Final model: Nagelkerke $R^2 = 0.647$, WRAT-3 ($p = .038$) and Illness ($p = .014$).