

# Does Coping Mediate the Relationship Between Personality and Cardiovascular Health in African Americans?

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Few studies have examined traits or behaviors that may predispose some African Americans to poor cardiovascular health outcomes. While several models of personality exist, the 5-factor model (FFM) is arguably the best representation of personality and provides a useful framework for the study of personality and health. Among personality characteristics associated with health risks among African Americans, a high-effort coping style called John Henryism is among the most thoroughly examined. It is not clear if personality coping and health are connected in a meaningful way. The present study utilized data from the Baltimore Study of Black Aging (BSBA) to examine whether personality was linked to John Henryism, how personality might be linked to cardiovascular health, and how John Henryism might mediate the relationship between personality and cardiovascular health. The sample consisted of 234 older African Americans (mean age, 67 years), 28% of which were men. Regressions were used to examine the questions. The results indicated that those who are more neurotic report more cardiovascular health problems, and that openness and conscientiousness were significant predictors of active coping. The mediation analysis results suggest that coping style did not mediate the relationship between personality and reports of cardiovascular health problems. These findings highlight the importance of personality in accounting for cardiovascular health in African Americans.

**Keywords:** African Americans ■ cardiovascular ■ psychology

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## INTRODUCTION

Although African American health disparities have been well documented,<sup>1,2</sup> few studies have examined those traits or behaviors that predispose some African Americans to risk for poor health outcomes and increased psychopathology. Personality and poor coping behaviors in particular may be mechanisms leading to higher risk for psychological morbidity and mortality in some individuals. Personality has been defined as individual characteristics that encompass feelings, thinking, and behavior.<sup>3</sup> In an attempt to identify prospectively those personality characteristics associated with psychopathology or health risks such as hypertension, researchers have employed various personality inventories and attempted to associate them with clinical outcomes.<sup>4</sup>

Among personality characteristics associated with health risks among African Americans, a high-effort coping style called John Henryism is among the most thoroughly examined. It has been described as “a strong behavioral predisposition to cope actively with psychosocial and environmental demands.”<sup>5</sup> John Henryism is a coping style associated with intense energy and hard-work expended in the pursuit of goals. In the presence of adequate physical and environmental resources, John Henryism may be associated with positive health outcomes; however, in the absence of these resources, it may lead to disappointment, rumination, poor social relations, and chronic physiological arousal.<sup>5-7</sup>

Moreover, evidence suggests that John Henryism is a risk factor for cardiovascular dysregulation, particularly among African American men and women of low socioeconomic status (SES).<sup>5-12</sup> The preponderance of evidence does not support differences in the predictive validity of John Henryism for cardiovascular and psychological outcomes.<sup>13</sup> These cardiovascular complications tied to low education and low income may increase the risk of cardiovascular disease or cardiovascular-related morbidity and mortality among African Americans. Scientists hypothesize that a high-effort coping style in the presence of additional financial or other-

based stress could lead to frustration and greater psychological and physiological health problems.<sup>7,14</sup>

Several models of personality exist. However, it is argued that the empirically based 5-factor model (FFM) is the best representation of personality and provides a useful framework for the study of personality and health.<sup>15-17</sup> This hierarchical model posits that human personality can be captured by 5 broad relatively independent domains, each composed of specific factors called facets: (1) neuroticism (N; a predisposition towards negative affect is composed of anxiety, hostility, depression, self-consciousness, impulsiveness, and vulnerability); (2) extraversion (E; a desire for both a greater quantity and intensity of interpersonal interaction as is indexed by warmth, gregariousness, assertiveness, activity, excitement seeking, and positive emotion); (3) openness to experience (O; a tendency to seek new experiences and perspectives manifest as fantasy, aesthetics, feelings, actions, ideas, and values); (4) agreeableness (A; a perspective that emphasizes the positive qualities in others and an accommodating social presence measured by trust, straightforwardness, altruism, compliance, modesty, and tendermindedness), and (5) conscientiousness (C; a quality associated with persistence and attention to detail in goal-directed behaviors as is best view by measuring competence, order, dutifulness, achievement striving, self-discipline, and deliberation).<sup>18</sup>

The FFM has been researched and validated across cultures,<sup>19</sup> genders,<sup>20</sup> and ages.<sup>21</sup> In addition, studies have shown the Neuroticism Extraversion Openness Personality Inventory-Revised (NEO PI-R) domains to be heritable,<sup>22</sup> suggesting that they are not only behavioral descriptions but phenotypes of temperamental tendencies towards certain cognitive and emotional patterns in behavior.<sup>17</sup> Recently, the NEO PI-R factor structure was validated in a large sample of African Americans,<sup>23</sup> supporting the instrument's utility in this population. The NEO PI-R may be useful in health research for identifying "at-risk" personality profiles among minority as well as majority racial groups.

Research suggests that combinations of domains that embody distinct personality styles may be better predictors of health and health behaviors, than the individual domains considered separately. For instance, higher N and related N facets (anger, hostility, anxiety) and the E facet (sensation seeking), have been associated with alcohol consumption and subjective intoxication.<sup>24-26</sup> Individuals who are higher on N, E, and N facet anxiety are more likely to smoke,<sup>18,27</sup> and those lower on depression, another facet of N, are more likely to exercise.<sup>26</sup>

Furthermore, increased cardiovascular reactivity to stress has been found to be associated with higher levels of antagonistic hostility<sup>28</sup> and anger,<sup>29</sup> facets related to higher N and lower A.<sup>30</sup> Other research has shown lower E scores to predict increased cardiovascular reactivity to stress.<sup>31</sup> Research also finds that a low N and high C personality style is associated with participation in social/

relaxation activities,<sup>32</sup> more wellness behaviors and less risk taking.<sup>33</sup> In contrast, a high N and low C personality style has been associated with health risk behaviors, fewer effective coping strategies, and mortality.<sup>34-36</sup>

These risk factors are not typically associated with individual health behaviors, in isolation. Associated health behaviors usually occur together with negative behavioral factors (eg, smoking, alcohol consumption, sedentary life style, and poor diet) that are more prevalent among individuals of low SES.<sup>37</sup> Constellations of behavioral factors among groups may be due to common personality traits or styles of coping among group members. Personality traits, such as higher hostility,<sup>38,39</sup> depression<sup>40</sup> and low openness to experience (O)—traits associated with poor psychosocial functioning, less effective stress coping, and risky health behaviors—are reported to be more common among low-SES groups.<sup>41</sup>

As far as we are aware, until now, no previous research has tested the association between John Henryism and the FFM domains. Moreover, there is little known about how John Henryism coping style may affect the relationship between FFM domains and health symptoms. In the present study we examined these relationships and expected to find that the John Henryism coping style was associated with global personality traits that are typically associated with poor health. Although both personality profiles have been well researched, studies have not yet analyzed how they correlate between each other or how John Henryism may affect the relationship between FFM domains and health.

## METHODS

### Data

The Baltimore [Maryland] Study of Black Aging (BSBA)<sup>42,43</sup> was initiated in 1997 to recruit a large sample of educationally diverse African American adults for the purpose of studying biobehavioral relationships among cognitive functioning, mental health, and physical health indices. The BSBA consists of 8 separate and different waves of data collection. The third wave of this study focused on personality, which was assessed on 285 individuals. Data were collected in paper-and-pencil format using the NEO-PI-R. Using criteria in line with the NEO-PI-R manual,<sup>18</sup> data from 51 participants were excluded from the analysis for the following reasons: protocols missing more than 40 items (7 participants); repetitive response set (eg, 10 consecutive neutral responses, 41 participants); and disagreeing with having answered honestly (3 participants). However, the neutral was used to substitute missing data in protocols with fewer than 40 missing items. Our sample showed an average of 2.1 items missing in their NEO-PI-R protocols.

Our final analytic data set included 234 participants with valid NEO-PI-R protocols. Individuals who provided valid NEO-PI-R data were on average 2.7 years younger than those with invalid protocols, but otherwise

there were no differences on observed variables between individuals in the 2 samples. All the participants were African Americans living in the metropolitan Baltimore area. The analytic sample consisted of 65 men (28%) and 169 women (72%). Ages ranged from 49 to 88 years (mean = 67 years, SD = 8.67), and the average years of formal education in the sample was 11 years (SD = 3.08).

**Measures**

**Demographic measure included age (in years), education (in years), and gender.** The NEO-PI-R was designed to provide a description of general personality relevant to clinical, counseling, and educational situations. It is based on the FFM and comprised of 240 items rated along a 5-point scale from strongly disagree to strongly agree, and 3 validity items. The NEO-PI-R is designed to measure the broad band factors of N, E, O, A, and C. Each of the 5 factors, also known as domains, consists of 6 facets, and each facet is measured by 8 individual items. Following the procedure of calculating the facet and factor scores described in the NEO-PI-R scoring manual,<sup>18</sup> the individual items are summed to produce a raw facet score. In the present sample, the internal consistency coefficients ranged from 0.74 to 0.86 for domain scales, and from 0.30 to 0.73 for facet scales (cf).<sup>23</sup>

John Henryism was measured using the 12-item John

Henryism Scale of Active Coping. This scale uses a 5-point Likert scale with scores ranging from 12 to 60. Higher scores indicate more John Henryism.<sup>44</sup>

Health concerns were assessed using the health problems checklist, which consists of 234 items and measures health problems across 15 domains.<sup>45</sup> The cardiovascular domain was used in the present analysis, given the nature of the most burdensome health disparities and the association between John Henryism and cardiovascular health. The average number of cardiovascular concerns was 4.02 (SD = 3.41).

**RESULTS**

The 5-factor structure has been previously examined in this sample.<sup>23</sup> The data replicate the classic structure that has been previously found for the NEO.<sup>18</sup> So in this analysis, we started by examining the relationship among the variables by calculating simple correlations among the measures.

As can be seen in Table 1, there are significant inter-correlations among the personality variables and relationships among neuroticism, John Henryism, and conscientiousness.

**Linear Regression**

To examine our first 1 questions: “Does NEO predict cardiovascular health problems?” and “Does NEO predict

**Table 1.** Correlations

	1	2	3	4	5	6	7	8	9
1) Age	1.00								
2) Gender	0.12	1.00							
3) Education	-0.28 <sup>b</sup>	0.06	1.00						
4) Neuroticism	0.07	0.02	-0.18 <sup>b</sup>	1.00					
5) Extraversion	-0.15 <sup>a</sup>	0.05	0.23 <sup>b</sup>	-0.23 <sup>b</sup>	1.00				
6) Openness	-0.32 <sup>b</sup>	0.01	0.39 <sup>b</sup>	-0.12 <sup>b</sup>	0.46	1.00			
7) Agreeableness	-0.05	0.12	0.02	-0.31 <sup>b</sup>	0.02	0.11	1.00		
8) Conscientiousness	-0.03	0.07	0.21 <sup>b</sup>	-0.52 <sup>b</sup>	0.23 <sup>b</sup>	0.16 <sup>a</sup>	0.32 <sup>b</sup>	1.00	
9) John Henryism	-0.19	-0.11	0.26 <sup>b</sup>	-0.02	-0.01	0.29 <sup>b</sup>	0.01	-0.26 <sup>b</sup>	1.00

<sup>a</sup> p < .01.

<sup>b</sup> p < .001.

**Table 2.** Linear Regressions for Personality and Cardiovascular Health<sup>a</sup>

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Standard Error	β		
1	(Constant)	5.449	4.376		1.245	.214
	age	-.078	.026	-.202	-2.999	.003
	gender	.134	.475	.018	.283	.777
	educ	-.191	.076	-.176	-2.508	.013
	neon	.067	.016	.330	4.344	.000
	neoe	-.033	.017	-.138	-1.903	.058
	neoo	-.001	.021	-.003	-.042	.966
	neoa	-.002	.017	-.007	-.101	.920
	neoc	.031	.017	.136	1.778	.077

<sup>a</sup> Adjusted R<sup>2</sup> = 0.137.

scores on the John Henryism scale?,” we used linear regressions to determine if personality predicted cardiovascular health problems, while controlling for age, gender, and education. In addition, we used a separate linear regression to examine personality domains as predictors of the John Henryism measure after controlling for the same covariates.

### Personality and Cardiovascular Health

The results of the linear regression analyses using personality as a predictor of cardiovascular health problems are shown in Table 2. The results indicated that age ( $p < .001$ ) and education ( $p < .003$ ) were the significant demographic indicators of cardiovascular health problems. Of the NEO facets, we found that neuroticism ( $p < .001$ ) was the only personality variable that significantly predicted of cardiovascular health problems.

### Personality and John Henryism

Using linear regression, we predicted scores on the John Henryism measure using the various personality facets (Table 3) while controlling for education, gender, and age. The results indicated that education was the only demographic indicator of John Henryism score ( $p < .003$ ). Of the NEO facets, we found that openness ( $p < .016$ ) and conscientiousness ( $p < .001$ ) were significant predictors of John Henryism scores.

### John Henryism as a Mediating Factor

Using the results found in the stepwise regression, the second objective was to examine if John Henryism mediated the relationship between personality (neuroticism) and cardiovascular health problems (Figure). Establishing mediation has been discussed by Baron and Kenny,<sup>46</sup> and Judd and Kenny.<sup>47</sup> They have suggested 4 steps in establishing the presence of partial and complete mediation that are pertinent for the analyses presented here:

- Step 1: Demonstrate the initial variable is correlated with the outcome. We used cardiovascular health problems as the criterion variable in a regression equation and personality (neuroticism) as a predictor. This step establishes that there is an effect that may be mediated.
- Step 2: Show that the initial variable is correlated with the mediator. John Henryism was used as the criterion variable in the regression equation, and personality (neuroticism) was used as a predictor. In this step, the mediator is treated as if it were an outcome variable.
- Step 3: Show that the mediator affects the outcome variable. Cardiovascular health problems were used as the criterion variable in a regression equation and John Henryism was used as the predictor. In this step, we establish if the effect (John Henryism) at least *partially* mediated the outcome (cardiovascular health problems).
- Step 4: To demonstrate that the mediator completely mediates the relationship between the criterion and the outcome, the effect of the relationship between the criterion and the outcome should be 0. This would mean that John Henryism *completely* mediates the relationship between personality (neuroticism) and cardiovascular health problems. The effect of personality (neuroticism) on cardiovascular health problems controlling for John Henryism should then be 0.

Our analyses failed at step 2 during our attempt to establish that John Henryism was related to the measure of cardiovascular health problems. Since this step was not significant, no further mediation analyses were attempted.

### DISCUSSION

The purpose of this paper was to examine 3 questions concerning the relationship among personality, cardiovascular health and active coping:

**Table 3.** Linear Regressions for Personality and John Henryism<sup>a</sup>

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Standard Error	β		
1	(Constant)	25.624	5.517		4.644	.000
	age	-.023	.033	-.045	-.706	.481
	gender	-1.194	.600	-.120	-1.992	.048
	educ	.352	.096	.243	3.687	.000
	neon	-.028	.019	-.104	-1.460	.146
	neoe	-.042	.022	-.132	-1.934	.054
	neoo	.105	.027	.283	3.926	.000
	neoa	.036	.022	.107	1.682	.094
	neoc	-.122	.022	-.403	-5.613	.000

<sup>a</sup> Adjusted R<sup>2</sup> = .248.

- Does NEO predict cardiovascular health problems?
- Does the NEO predict active coping as measured by scores on the John Henryism scale?
- Does active coping mediate the relationship between personality and cardiovascular health problems?

The results suggest that there is a particular pattern of relationships that exists among these variables.

First, the results indicated that at least 1 dimension of personality predicts reports of cardiovascular health. The findings suggest that those who are more neurotic report more cardiovascular health problems. This indicates that neurotic behavior style has poor health consequences. Given the prevalence of cardiovascular health problems that affect African Americans at the population level, this begs the question as to whether there is more neuroticism among African Americans than other groups. Previous research shows that the general pattern of personality is the same in African Americans as whites.<sup>22</sup> The presence of this personality style might still be more prevalent in this population compared to others, but there is no evidence at this time to be able to support this hypothesis.

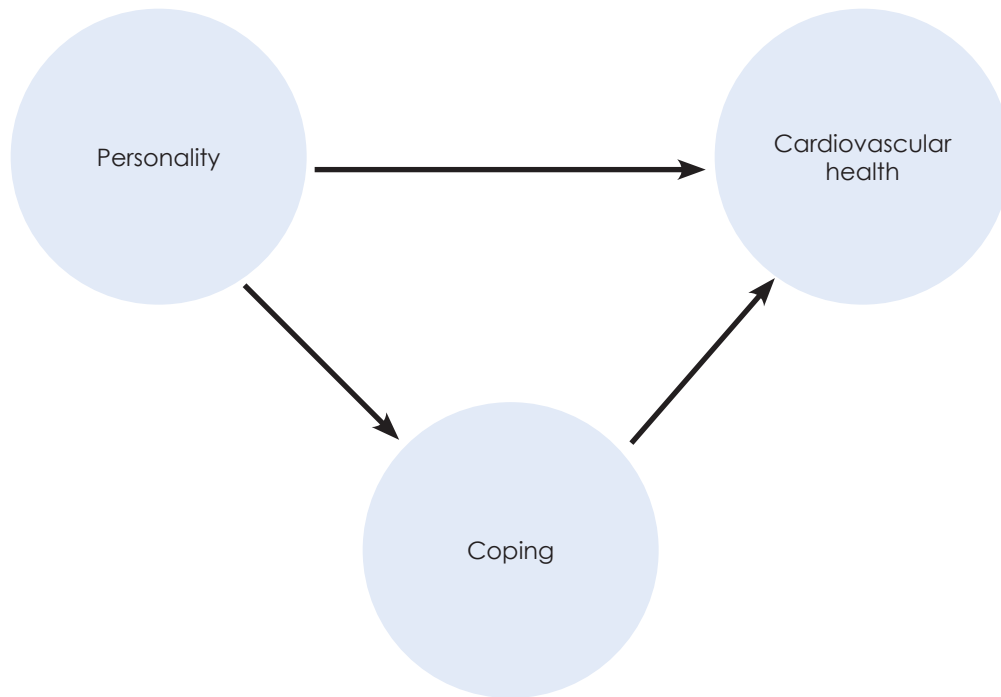
The second question focused on personality and active coping. We did observe that 2 measures were significant predictors of active coping: openness and conscientiousness. The John Henryism measure is formally considered a measure of coping, but many consider it a form of personality type. The results here show that it does have char-

acteristics that are related to traditional measures of personality. In particular, John Henryism is strongly associated with the domains of openness to experience and conscientiousness. Openness is related to characteristics such as imagination and insight, while one of the hallmarks of conscientiousness is planning. Taken together these domains fit well with John Henryism coping since this style of problem solving involves developing strategies to overcome adversity in service to goal achievement (ie, imagination and planning). Moreover, John Henryism may provide important additional information concerning determination that may not be well measured in the FFM.

The last question posed was whether active coping mediates the relationship between personality and cardiovascular health problems. The results suggest that while there are significant relationships between personality and active coping and with cardiovascular health problems, John Henryism does not mediate the relationship between FFM personality domains and cardiovascular health problems.

We recognized that we did not treat the John Henryism variable in the same manner as measured in the original study by James et al,<sup>6</sup> nor did we include a measure of income, although we did include another proxy measure of SES by including education in the analysis. It may be this different approach that explains why we did not find that active coping mediates the relationship between personality and cardiovascular health problems. It may also be due to the self-reported measure of cardiovascular

**Figure.** Mediation Effect of Coping on Personality and Cardiovascular Health



health problems we used. Future work will seek to remedy these limitations by including additional SES (education, income, attained indices of attained wealth) indicators as well as objective indicators of cardiovascular health such as BMI and blood pressure.

## REFERENCES

- Williams DR, Collins C. US Socioeconomic and racial-differences in health—patterns and explanations. *Annu Rev Sociol.* 1995;21:249-386.
- Burchard EG, Ziv E, Coyle N, et al. The importance of race and ethnic background in biomedical research and clinical practice. *N Engl J Med.* 2003;348(12):1170-1175.
- Pervin LA, John OP. *Personality: theory and research.* 7th ed. New York, NY: John Wiley; 1997.
- Smith TW, MacKenzie J. Personality and risk of physical illness. *Annu Rev Clin Psychol.* 2006;2:435-467.
- James SA. John Henryism and the health of African-Americans. *Cult Med Psychiatry.* 1994;18(2):163-182.
- James SA, Hartnett SA, Kalsbeek WD. John Henryism and blood pressure differences among black men. *J Behav Med.* 1983;6(3):259-278.
- Bennett GG, Merritt MM, Wolin KY. Ethnicity, education, and the cortisol response to awakening: a preliminary investigation. *Ethn Health.* 2004;9(4):337-347.
- James SA, LaCroix, AZ, Kleinbaum DG, Strogatz DS. John Henryism and blood pressure differences in black men. *J Behav Med.* 1984;7:259-275.
- James SA, Strogatz DS, Wing SB, Ramsey, DL. Socioeconomic status, John Henryism, and hypertension in blacks and whites. *Am J Epidemiol.* 1987;126(4):664-673.
- Light KC, Brownley KA, Turner JR, et al. Job status and high-effort coping influence work blood pressure in women and blacks. *Hypertension.* 1995;25(4 pt1):554-559.
- Markovic N, Bunker CH, Ukoli FA, Kuller LH. John Henryism and blood pressure among Nigerian civil servants. *J Epidemiol Community.* 1998;52(3):186-190.
- Wiist WH, Flack JM. A test of the John Henryism hypothesis: cholesterol and blood pressure. *J Behav Med.* 1992;15(1):15-29.
- Bennett GG, Merritt MM, Edwards CL, Whitfield KE, Brandon DT, Tucker RD. Stress, Coping, and Health Outcomes Among African Americans: A Review of the John Henryism Hypothesis. *Psychol Health.* 2004;19(3):369-383.
- James SA, LaCroix AZ, Kleinbaum DG, Strogatz DS. John Henryism and blood pressure differences among black men. II. The role of occupational stressors. *J Behav Med.* 1984;7(3):259-275.
- Digman JM. Personality structure: Emergence of the five-factor model. *Annu Rev Psychol.* 1990;41:417-440.
- John OP. The "Big Five" factor taxonomy: Dimensions of personality in the natural languages and in questionnaires. In: Pervin LA, ed. *Handbook of personality: Theory and research.* New York, NY: Guilford Press; 1990.
- McCrae RR, Costa PT Jr. Trait Explanations in Personality Psychology. *Eur J Pers.* 1995;9:231-252.
- Costa PTJ, McCrae RR. *Revised NEO Personality Inventory (NEO-PI-R) and NEO Five-Factor Inventory (NEO-FFI) Professional Manual.* Odessa, FL: Psychological Assessment Resources Inc; 1992.
- McCrae RR, Costa PT Jr, Bosse R. Anxiety, extraversion and smoking. *Br J Soc Clin Psychol.* 1978;17(3):269-273.
- Costa PTJ, Terracciano A, McCrae RR. Gender differences in personality traits across cultures: Robust and surprising findings. *J Pers Soc Psychol.* 2001;81:322-331.
- Roepke S, McAdams LA, Lindamer LA, Patterson TL, Jeste DV. Personality profiles among normal aged individuals as measured by the NEO-PI-R. *Aging and Mental Health.* 2001;5:159-164.
- Heath AC, Neale MC, Kessler RC, Eaves LJ, Kendler KS. Evidence for genetic influences on personality from self-reports and informant ratings. *J Pers Soc Psychol.* 1992;63(1):85-89.
- Savla J, Davey A, Costa PT Jr, Whitfield KE. Replicating the NEO-PI-R factor structure in African-American older adults. *Pers Individ Differ.* 2007;43(5):1279-1288.
- Hammersley R, Lavelle TL, Forsyth AJ. Adolescent drug use, health and personality. *Drug Alcohol Depend.* 1992;31(1):91-99.
- Viken RJ, Rose RJ, Morzorati SL, Christian JC, Li TK. Subjective intoxication in response to alcohol challenge: heritability and covariation with personality, breath alcohol level, and drinking history. *Alcohol Clin Exp Res.* 2003;27(5):795-803.
- Siegler IC, Blumenthal JA, Barefoot JC, et al. Personality factors differentially predict exercise behavior in men and women. *Womens Health.* 1997;3(1):61-70.
- Cherry N, Kiernan K. Personality scores and smoking behaviour. A longitudinal study. *Br J Prev Soc Med.* 1976;30(2):123-131.
- Suarez EC, Harlan E, Peoples MC, Williams RB Jr. Cardiovascular and emotional responses in women: the role of hostility and harassment. *Health Psychol.* 1993;12(6):459-468.
- Siegmán AW, Anderson R, Herbst J, Boyle S, Wilkinson J. Dimensions of anger-hostility and cardiovascular reactivity in provoked and angered men. *J Behav Med.* 1992;15(3):257-272.
- Watson D, Clark LA. On traits and temperament: general and specific factors of emotional experience and their relation to the five-factor model. *J Pers.* 1992;60(2):441-476.
- Pearson GL, Freeman FG. Effects of extraversion and mental arithmetic on heart-rate reactivity. *Percept Mot Skills.* 1991;72(3 pt 2):1239-1248.
- Marks GR, Lutgendorf SK. Perceived health competence and personality factors differentially predict health behaviors in older adults. *J Aging Health.* 1999;11(2):221-239.
- Booth-Kewley S, Vickers RR Jr. Associations between major domains of personality and health behavior. *J Pers.* 1994;62(3):281-298.
- Bernard NS, Dollinger SJ, Ramaniah NV. Applying the big five personality factors to the impostor phenomenon. *J Pers Assess.* 2002;78(2):321-333.
- Terracciano A, Costa PT Jr. Smoking and the Five-Factor Model of personality. *Addiction.* 2004;99(4):472-481.
- Wilson RS, Mendes de Leon CF, Bienias JL, Evans DA, Bennett DA. Personality and mortality in old age. *J Gerontol B Psychol Sci Soc Sci.* 2004;59(3):P110-P116.
- Laaksonen M, Prattala R, Lahelma E. Sociodemographic determinants of multiple unhealthy behaviours. *Scand J Public Health.* 2003;31(1):37-43.
- Kubzansky LD, Kawachi I, Sparrow D. Socioeconomic status, hostility, and risk factor clustering in the Normative Aging Study: any help from the concept of allostatic load? *Ann Behav Med.* 1999;21(4):330-338.
- Barefoot JC, Peterson BL, Dahlstrom WG, Siegler IC, Anderson NB, Williams RB Jr. Hostility patterns and health implications: correlates of Cook-Medley Hostility Scale scores in a national survey. *Health Psychol.* 1991;10(1):18-24.
- Harper S, Lynch J, Hsu WL, et al. Life course socioeconomic conditions and adult psychosocial functioning. *Int J Epidemiol.* 2002;31(2):395-403.
- Korner A, Geyer M, Gunzelmann T, Braher E. The influence of socio-demographic factors on personality dimensions in the elderly. *Z Gerontol Geriatr.* 2003;36(2):130-137.
- Whitfield KE, Wiggins, SA. The influence of social support and health on everyday problem solving in adult African Americans. *Exp Aging Res.* 2003;29(1):1-13.
- Whitfield KE, Baker-Thomas TA, Heyward K, Gatto M, Williams Y. Evaluating a measure of everyday problem solving for use in African-Americans. *Exp Aging Res.* 1999;25(3):209-222.
- James SA. The John Henryism Scale for active coping. In: Jones RJ, ed. *Handbook of Tests and Measurements from Black Populations.* Hampton, VA: Cobb & Henry; 1996.
- Schinka JA. *The Health Problems Checklist.* Odessa, FL: Psychological Assessment Resources Inc; 1989.
- Baron RM, Kenny DA. The moderator-mediator variable distinction in social psychological research: Conceptual, strategic and statistical considerations. *J Pers Soc Psychol.* 1986;51:1173-1182.
- Judd CM, Kenny DA. Process analysis: Estimating medication in treatment evaluations. *Eval Rev.* 1981;5:602-619. ■