HHS Public Access

Author manuscript

Psychosom Med. Author manuscript; available in PMC 2020 May 01.

Published in final edited form as:

Psychosom Med. 2019 May ; 81(4): 341–351. doi:10.1097/PSY.0000000000000688.

Prospective associations of adolescent conscientiousness with psychological resources and metabolic syndrome in Black and White men

Katherine A. Duggan, Ph.D.,
Department of Psychiatry, University of Pittsburgh

J. Richard Jennings, Ph.D.,
Departments of Psychiatry and Psychology, University of Pittsburgh

Karen A. Matthews, Ph.D.
Departments of Psychiatry, Epidemiology, Psychology, and Clinical and Translational Science, University of Pittsburgh.

Abstract

Objective: Conscientiousness predicts better psychological resources as well as lower cardiovascular mortality and lower metabolic syndrome (MetS) risk. However, the benefits of conscientiousness might be amplified, disabled, or reversed in disadvantaged groups. This study is the first to test these competing hypotheses for prospective associations between adolescent conscientiousness and adult psychological resources and MetS.

Method: Participants were 220 men (54.6% Black) from the Pittsburgh Youth Study . Adolescent conscientiousness (Mean age=16, *SD*=1) was rated by participants and their parents. Adult (Mean age=32, *SD*=1) socioeconomic status (SES; occupation and education), psychological resources (composite of positive affect, purpose in life, optimism, self-mastery, and self-esteem), and MetS scores (glucose, lipids, waist circumference, and blood pressure) were measured. Hierarchical regressions were used to evaluate the association of conscientiousness with adult psychological resources and MetS scores, with testing of moderation by race and SES.

Results: Self- and parent-reported conscientiousness were associated with better psychological resources (βs=0.23–0.29, *p*s≤.015), with no moderation by race or socioeconomic status. In the full sample, a three-way interaction of self-reported conscientiousness, race, and SES was obtained for MetS (β=0.12, *p*=.093). Subgroup analysis indicated that self-reported conscientiousness was related to higher MetS scores in low SES Black men (β_{int}=−0.22, *p*=.022), but there was no comparable linear (βs≤0.08, *p*s≥.50) or interaction (βs≤−0.13 *p*s≥.25) pattern in White men.

Correspondence concerning this article should be addressed to: Katherine A. Duggan, Department of Psychiatry, University of Pittsburgh School of Medicine, 3811 O'Hara Street, Pittsburgh, PA 15213. Phone: (412) 648-7070, Fax: (412) 648-7160, dugganka@upmc.edu or katherineduggan@gmail.com.

This study is part of the PATHS to Healthy Hearts Study, a project on early life adversity, sleep, and cardiovascular risk in Black and White men from the Pittsburgh Youth Study. Previous work from this project is cited where appropriate. The authors would like to thank the study originators, Drs. Rolf Loeber and Magda Stouthamer-Loeber, and Dr. Dustin Pardini.

Conclusions: Adolescent conscientiousness was beneficial for adult psychological resources, regardless of race or SES. However, there may be physiological costs of conscientiousness for Black men from disadvantaged backgrounds.

Keywords

personality; psychological well-being; metabolic syndrome; socioeconomic status

Cardiovascular disease (CVD) is the leading source of morbidity and mortality in the United States (1). To identify individuals at early risk for CVD, research is increasingly focusing on metabolic syndrome (MetS), a combination of modifiable CVD risk factors (high waist circumference, triglycerides, blood pressure, fasting glucose, and reduced high density lipoprotein (HDL) cholesterol; 2). National estimates (1999–2010) show that while MetS prevalence among White men decreased, prevalence among Black men increased (3).

Conscientiousness, a trait which describes socially-prescribed impulse control, planfulness, persistence, and dependability (4), is associated with health-promoting behaviors (5) and lower cardiovascular mortality (6). Low conscientiousness is associated with higher MetS cross-sectionally (7–9), with few exceptions (10). In the Hawaii Personality and Health Cohort, low childhood conscientiousness predicts higher mid-life metabolic dysregulation (11). The pathways linking conscientiousness with metabolic dysregulation in this sample—educational attainment and health behaviors (12)—are consistent with the processes through which conscientiousness typically relates to health (4).

Most theories posit that conscientiousness predicts better health. However, some theories suggest the benefits of conscientiousness may be moderated by the social context, which could amplify, attenuate, or even reverse associations. A life course buffering or resource substitution perspective (4) based on the availability of *alternative resources* suggests conscientiousness could act as a substitute for missing health-enhancing resources, and thus associations between conscientiousness and health might increase in these contexts. In this scenario, conscientiousness should be more protective for individuals who are low SES or Black, relative to individuals who are high SES or White (see Figure 1a).

An alternative hypothesis, disablement (4), suggests associations between conscientiousness and health may be attenuated in the absence of resources that promote health, such as in low SES communities or in disadvantaged racial groups. In other words, disablement theory proposes that low SES and minority racial status function as *proxies* for settings deprived in the material and/or psychosocial resources required for conscientiousness to benefit health. From this perspective, conscientiousness should be less or not protective for individuals who are low SES or Black, relative to individuals who are high SES or White (see Figure 1b). It is also possible that these factors may synergistically interact, such that moderation might be particularly strong in individuals who are from socioeconomically- *and* racially-disadvantaged backgrounds due to a lifetime of exposure to risks and chronic stressors (4).

John Henryism theory suggests a third pattern which emphasizes the physiological cost of effortful striving to cope with difficult life circumstances. John Henryism active coping involves a strong disposition to persistently and actively cope with severe chronic stressors

and may have a physiological cost among individuals who are Black, especially when they are also from socioeconomically-disadvantaged backgrounds (13,14) Dr. Sherman A. James initially proposed the hypothesis and was inspired by the American folklore legend of John Henry, a “steel driving” man who competed with a steam drill to build a railroad tunnel and won—but subsequently died of exhaustion (15). Early research found John Henryism was associated with higher blood pressure in low SES Black men (14), and recent cross-sectional work shows John Henryism is related to higher MetS risk in men and women who are Black and low SES (16). The recent related “skin-deep resilience” literature (17) also posits a physiological cost to traits like John Henryism, self-control, competence, and conscientiousness for individuals who are Black and from socioeconomically-disadvantaged backgrounds while simultaneously leading to better psychological outcomes. For example, conscientiousness has been associated with more education, less depression, and stronger social relationships in individuals who are Black and White, but with a greater risk of becoming ill following exposure to the rhinovirus only for individuals who are Black and low SES (18).

Although this pattern would be unexpected given prior research on conscientiousness and MetS, it does suggest a third moderation hypothesis: that conscientiousness could be associated with worse physical health for Blacks or low SES individuals, but better health for Whites or high SES individuals (see Figure 1c). The racial disparities literature suggests this pattern may occur for a number of reasons, including stress and discrimination (13), use of emotional suppression strategies (19), and lower aspirations and expectations for later success, which may result in lower academic achievement (20) and more goal disengagement (21). Additionally, the fast life history strategies literature suggests they might take on adult social roles earlier (20,21) due to living in stressful environments.

In summary, the primary purpose of the current study is to examine the role of adolescent conscientiousness in predicting adult psychological resources and MetS in an urban sample of Black and White men followed since they were children. Generally, we expected conscientiousness to predict more psychological resources and lower MetS scores. However, we recognize that an emerging pattern of results suggests individuals who are racially- or socioeconomically-disadvantaged might not benefit from conscientiousness. Thus, the secondary purpose was to test competing moderating hypotheses for conscientiousness, followed by examining potential plausible pathways theoretically-consistent with the interaction pattern. Each theory posits that conscientiousness should be associated with higher psychological resources, but only John Henryism predicts that conscientiousness should relate to higher MetS scores in individuals from disadvantaged backgrounds (i.e., Black or low SES men, as in Figure 1c).

Methods

Participants were recruited from the youngest cohort of the Pittsburgh Youth Study (PYS; 22), a longitudinal study of boys (N=849) recruited from Pittsburgh Public Schools in 1987–1988. They were randomly chosen to undergo a multi-informant screening that assessed conduct problems, with half the sample recruited from the top 30th percentile on the screening measure for a total of 503 boys in the longitudinal sample. As part of an ancillary

study, a subset of participants and their parents rated personality in 1997–1998, when the boys were 16.

Beginning in 2014, individuals were recruited for the PATHS to Healthy Hearts Study, a cardiovascular follow-up. All research procedures were approved by the University of Pittsburgh Institutional Review Board. All men provided informed consent. Of the PATHS sample (N=312), 84 men did not have both self-reported and parent-rated adolescent conscientiousness, and an additional 8 were missing adult SES, MetS, or psychological resources, yielding a final (maximal) sample size of 220 (54.6% Black; 50.5% low risk for antisocial/delinquent behavior at study screening). Compared with excluded PATHS participants (n=92), the 220 men in the current sample were not significantly different on primary study measures, with the exception of adult physical activity levels (p=.019) and waist circumference (p=.009). Participants included in the current analysis reported lower physical activity (n=220; M=6.63, 95% CI [6.48, 6.78], a natural logged score equal to approximately 707.5 kcal) than excluded participants (n=92; M=6.96 [6.72, 7.20], approximately 1003.6 kcal). Participants included in the current analysis also had higher waist circumference (n=194; M=96.38cm [93.97, 98.79]) than excluded participants (n=66; M=90.26cm [86.85, 93.67]).

Measures

Demographics.—Race was coded −1 for Black and +1 for White. Risk for antisocial/delinquent behavior (−1=low; +1=high) was assessed at the study screening. Adult SES indexed current occupational prestige (rated 0–9) and highest education (rated 1–7; 23), with occupation weighted by five and educational category weighted by 3, and higher scores indicating higher SES. The same measure was used to assess adolescent family SES annually (ages 13–16) by each participant's primary caretaker. In adulthood, the men also reported their educational attainment and current occupation, and these were coded into the same Hollingshead Index scores. Examples of occupational codes include 1 for grocery bagger and 9 for architect. Examples of educational codes include 1 for less than 7th grade education and 7 for a graduate degree (before weighting). For those currently unemployed, the job code was assigned the lowest occupation if they were on public assistance or their income was based on illegal activities. If they were currently unemployed but receiving unemployment compensation, the job code was based on the prior PYS visit (about 3 years earlier).

Personality.—Personality items were generated from the common language version of the California Child Q-set previously used in the older sample of this cohort (24). For the younger sample studied here, items were rewritten to be statements and simplified, new items were added, and the response format was changed to yes/no format (25–27). Eleven items assessing conscientiousness were rated separately by participants and their parent, e.g., "He can be trusted; he's reliable, and dependable" and "He has high standards for himself. He needs to do very well in the things he does." Items were averaged and scores range from 0–1, with higher scores indicating higher conscientiousness. Data from other studies suggests that there is measurement invariance in personality across age, self- and parent-

reports, and race (28–30). We do not have access to original item responses so cannot evaluate measurement invariance in the current sample.

Psychological resources.—Adult (Mean age=32, range [31, 34]) psychological resources were self-reported during the laboratory visit. Participants rated their positive affect "in general" using 10 PANAS items rated on a 5-point scale, including "excited" and "enthusiastic" (31; full sample α=.89; α=.88 in Black men and α=.89 in White men). Purpose in life was assessed using the Life Engagement Test (32), which includes 6 items (e.g., "To me, the things I do are all worthwhile") rated on a 4-point scale (full sample α=.80; α=.82 in Black men and α=.79 in White men). Optimism was measured using the Life Orientation Test-Revised (33), which includes 6 items (e.g., "Overall, I expect more good things to happen to me than bad") rated on a 4-point scale (full sample α=.81; α=.76 in Black men and α=.86 in White men). Self-mastery was assessed using the Pearlin Mastery Scale (34), which includes 7 items (e.g., I can do just about anything I really set my mind to") rated on a 5-point scale (full sample α=.82; α=.83 in Black men and α=.82 in White men). Finally, self-esteem was rated using the Rosenberg Self-Esteem Scale (35), which includes 10 items (e.g., "I feel that I am a person of worth, at least on an equal plane with others") on a 4-point scale (full sample α=.85; α=.84 in Black men and α=.86 in White men).

Using principal components analysis, these measures were reduced to a single factor which explained 60.8% of the variance (see 36). All measures were standardized, summed, and averaged; higher scores indicate more psychological resources. Two participants were missing scores on some components and thus have prorated psychological resource scores based on the components with available data. The composite has good internal consistency reliability (full sample α=.87; α=.89 in Black men and α=.85 in White men); prior work in this sample has shown measurement invariance for a psychological resource composite including purpose in life, optimism, self-mastery, and self-esteem across race (37).

MetS.—Adult MetS components (fasting glucose, triglycerides, reversed HDL cholesterol, waist circumference, and systolic blood pressure) were assessed at the laboratory visit (38). The values for each component were standardized, summed, and averaged to create MetS scores, which conceptualize of MetS as a spectrum of risk and allow for tracking change in risk over time, particularly in younger individuals (39,40). Participants (n=4) who were not fasting were removed from all MetS analyses. Four participants were missing some components and thus have prorated MetS scores based on components with available data. See Supplemental Digital Content for additional details on each component, including assays and coefficients of variation.

Health behaviors and obesity.—Seventeen participants were taking lipid-lowering, diabetes, or high blood pressure medications (0=no; 1=yes). Current (adult) smoking was coded as non-smoker/former smoker (coded 0), light smoker (≤10 cigarettes/day; coded 1) and heavy smoker (>10 cigarettes/day; coded 2). Current weekly, average physical activity was assessed using the Paffenbarger Physical Activity Questionnaire (41; kcal, analyzed using log-transformed scores). Weekly fruit and vegetable intake questions were modeled after the Behavioral Risk Factor Surveillance System survey (42). Adolescent BMI

(measured using Quetelet's formula concurrent with personality measurement) was derived from height measured using a stadiometer attached to the wall, and weight assessed using digital scales.

Potential psychosocial pathways.—Based on the models described in Figure 1, we evaluated whether plausible pathways reduced observed associations. Stress measures included perceived stress (43), total stressful life events in the past 6 months (44), and discrimination (45). Consequences and correlates of stress included emotional suppression (46), number of social roles (47), and goal disengagement (48). Adolescent academic engagement measures included academic achievement, aspirations, and expectations averaged across ages 13–16. For additional details, see the Supplemental Digital Content.

Analyses

Descriptive statistics and distributions were examined. *T*-tests and chi-squares were used to examine differences by race as well as attrition. Pearson and Spearman correlations describe bivariate associations between adolescent personality and adult SES, MetS scores, and psychological resources.

Hierarchical, nested linear regressions were conducted separately for MetS and psychological resources. Because 3-way interactions are difficult to interpret and there were substantial differences in SES by race, all analyses were *a priori* stratified by race, though results in the full sample are also presented. Self- and parent-reported conscientiousness were also examined separately. In analyses stratified by race, unadjusted associations for conscientiousness were examined (Model I), with subsequent adjustment for antisocial behavior/delinquency risk group (Model II; considered the "baseline" model). Next, linear SES (Model III) and the 2-way interaction of conscientiousness with SES (Model IV) were added. In the full sample, model building steps were similar, with parameters added hierarchically (linear parameters, followed by all two-way interactions, followed by the three-way interaction). Effect size measures presented include the overall model adjusted R^2 (the proportion of variance in the dependent variable explained by the independent variables in the model, adjusted for the number of the predictors), beta (*b*, quantifying the expected change in the dependent variable for each 1-unit increase in the predictor), and the standardized beta (β, quantifying the expected change in z-score units in the dependent variable for each 1-standard deviation increase in the predictor; 49). Results of all model-building steps are included in the Supplemental Digital Content; results for the final models are presented here.

Tests for multicollinearity, unusual and influential observations, non-normality of the residuals, heteroscedasticity of the residuals, and non-linear associations were evaluated. Aside from race and risk stratification group, MetS medications, and smoking, all predictor variables were mean-centered prior to analysis. Interactions were probed by visually examining plots of predicted scores for Black and White men low (−1 *SD*), at the average, and high (+1 *SD*) on conscientiousness and SES (50). In follow-up analyses for MetS scores, we explored the role of potential confounders and plausible pathways by adding linear parameters as well as 2-way interactions between each plausible pathway and SES.

Results

Table 1 displays descriptive statistics. Black men reported significantly lower adolescent family SES and adult SES, adolescent academic achievement, and adult goal disengagement, as well as higher positive affect, stressful life events, and discrimination. Additionally, Black men were more likely to be light smokers, whereas White men were more likely to be heavy smokers. Black men also had significantly lower triglycerides and significantly higher systolic blood pressure. There were no other significant differences, including self-reported conscientiousness, parent-rated conscientiousness, psychological resources, and MetS scores.

For correlations among all primary measures, see Table 2. In the full sample, adult psychological resources significantly correlated with low antisocial/delinquent behavior risk, higher self-reported conscientiousness, higher parent-rated conscientiousness, and higher adult SES. Associations with psychological resources were similar in Black and White men, with the exception that SES was weaker and did not reach statistical significance in Black men (r=.18 [−.004, .34]), but stronger and statistically significant in White men (r=.32 [.13, .48]). Antisocial/delinquent behavior risk group was statistically significant in Black men (r=−.19 [−.35, −.01]), but did not reach statistical significance in White men (r=−.19 [−.37, .01]). MetS scores correlated with higher self-reported conscientiousness in the full sample. When stratified by race, associations were statistically significant in Black men (r=.25 [.07, .41]), but were weaker and non-significant in White men (r=.07 [−.15, .29]).

For correlations between conscientiousness and specific psychological resources, see Table 3. In the full sample, self- and parent-reported conscientiousness had small to moderate correlations with each resource. Correlations were generally stronger for parent-ratings of conscientiousness. In Black men, conscientiousness was significantly correlated with each resource (.20≤rs≤−.39), except for self-reported conscientiousness and positive affect (r=.12 [−.06, .29]). In White men, conscientiousness was significantly correlated with each resource (.21≤rs≤−.36), except for self-reported conscientiousness and optimism (r=.09 [−.11, .29]), life engagement (r=.08 [−.12, .27]), and self-esteem (r=.18 [−.02, .36]).

We present below the best fitting regression models. Details of all model fitting procedures are described in the Supplementary Digital Content Tables 1–6.

Psychological Resources

Full sample.—When self-reported conscientiousness, race, antisocial/juvenile delinquency risk, and SES were examined in the full sample as predictors of psychological resources, the overall model was statistically significant (p<.001, adjusted R^2=.1253). Self-reported conscientiousness (β=0.24, p<.001), juvenile delinquency risk score (β=−0.15, p=.021), and SES (β=0.21, p=.002) were statistically significant, whereas race was trending in significance (β=−0.11, p=.088). Addition of the two-way interactions (overall model p<.001, adjusted R^2=.1227) and three-way interaction (overall model p<.001, adjusted R^2 =.1186) did not improve the overall model statistics, and the two-way (−0.09≤ βs≤0.03) and three-way (β=−0.01) interactions were non-significant (ps≥.19).

When parent-reported conscientiousness, race, antisocial/delinquency risk group, and SES were examined in the full sample as predictors of psychological resources, the overall model was statistically significant (p<.001, adjusted R^2=.1337). Parent-reported conscientiousness (β=0.27, p<.001) and antisocial/delinquent behavior risk group (β=−0.13, p=.041) were statistically significant, whereas race (β=−0.12, p=.081) and SES (β=0.14, p=.050) were trending. Addition of the two-way (overall model p<.001, adjusted R^2=.1261) and three-way (overall model p<.001, adjusted R^2 =.1312) interactions did not improve the overall model statistics, and the two-way (−0.05≤ βs≤0.07) and three-way (β=−0.11) interactions were non-significant (ps≥.14).

Black men.—For self-reports, the best overall model included conscientiousness, antisocial/delinquent behavior risk, and adult SES (p=.002; adjusted R^2=.0941). Conscientiousness (β=0.24, p=.007) was associated with significantly higher psychological resources; antisocial/delinquent behavior risk (β=−0.17, p=.062) and SES (β=0.15, p=.083) were trending. In the subsequent, not selected model that included the interaction (overall model p=.005, adjusted R^2=.0906), there was no significant interaction of conscientiousness and SES (β=−.07, p=.46).

For parent-rated conscientiousness, the best overall model included conscientiousness and antisocial/delinquent behavior risk group, but not SES (p<.001; adjusted R^2=.1065); conscientiousness was associated with significantly higher psychological resources (β=0.29, p<.001) and antisocial/delinquent behavior risk group was trending (β=−0.17, p=.060). In the later, not selected model that included the interaction (overall model p=.003, adjusted R^2=.0998), there was no significant interaction of conscientiousness with SES (β=0.07, p=.50).

White men.—For self-reports, the best overall model included conscientiousness, antisocial/delinquent behavior risk group, and SES (p<.001; adjusted R^2=.1452). Conscientiousness (β=0.23, p=.015) and SES (β=0.26, p=.008) were associated with significantly higher psychological resources. In the subsequent, not selected model that included the interaction (overall model p<.001, adjusted R^2=.1466), there was no significant interaction of conscientiousness and SES (β=−0.10, p=.28).

For parent-rated conscientiousness, the best overall model included conscientiousness, antisocial/delinquent behavior risk group, and adult SES (p<.001; Adj. R^2=.1532); conscientiousness (β=0.27, p=.009) and SES (β=0.20, p=.044) were significant. In the subsequent, not selected model that included the interaction (overall model p<.001, adjusted R^2=.1652), there was no significant interaction of conscientiousness with SES (β=−0.14, p=.13).

Summary.—In summary, both self-reported and parent-rated adolescent conscientiousness were related to higher adult psychological resources in Black and White men (see Figure 2 for a summary). Effect sizes for conscientiousness were similar across all models, with no interaction with race or SES. Thus, there was no evidence for moderation (i.e., disablement or buffering) of the benefits of conscientiousness for later psychological resources by race or SES.

Metabolic Syndrome

Full sample.—When self-reported conscientiousness was examined in the full sample as a predictor of MetS, the only statistically significant overall model included the three-way interaction of conscientiousness, race, and SES, as well as all lower-order parameters (overall model p=.048, adjusted R^2=.0397). Self-reported conscientiousness (β=0.14, p=.063), the interaction of self-reported conscientiousness and SES (β=−0.14, p=.066), and the three-way interaction of self-reported conscientiousness, race, and SES (β=0.12, p=.093) were trending. No other parameters were statistically significant. The model is trending (p=.078, adjusted R^2=.0302) when the three-way interaction is removed and only the two-way interactions are included, and the model is non-significant (p=.17, adjusted R^2=.0127) when only the linear parameters are included. Thus, the model with the three-way interaction is the best-fitting model.

For parent-reported conscientiousness in the full sample, none of the overall models were significant (ps≥.86). None of the linear (ps≥.32), two-way (ps≥.24), or three-way (p=.30) interactions were statistically significant.

Black men.—For self-reports, the best overall model included the interaction between conscientiousness and SES (p=.008; adjusted R^2=.0860; see Table 4). Conscientiousness was trending (β=0.18, p=.066), and the interaction between conscientiousness and SES was significant (β=−0.22, p=.022). To probe the linear interaction, we plotted predicted MetS scores for Black participants low (−1 *SD*), at the mean, and high (+1 *SD*) on SES and conscientiousness. As shown in Figure 3 for Black men who were low SES, high conscientiousness was associated with higher MetS scores and conversely low conscientiousness was associated with lower MetS scores. Supplemental analyses showed the interaction of self-reported conscientiousness and SES in Black men was significantly related to higher systolic blood pressure, with less robust evidence for HDL cholesterol and waist circumference. For parent-rated conscientiousness and MetS scores, all models were non-significant (ps≥.58), and all parameters were non-significant (ps≥.26). For more detailed information, see Supplemental Digital Content-Results.

White men.—For self-reported conscientiousness, all models were non-significant (ps≥.51), and all parameters were non-significant (ps≥.45). For parent-rated conscientiousness, all models were also non-significant (ps≥.70), and all parameters were non-significant (ps≥.25). Results for the fullest-fitted models are presented in Table 4 for comparison. This series of analyses is most consistent with John Henryism theory, in which conscientiousness is risky, but only for Black men who are from low socioeconomic strata.

Sensitivity to adolescent family SES and MetS confounders.—We examined whether the results were specific to adult SES. Overall, the models with adult SES typically fit better in terms of the overall model statistics and the significance of the SES parameter, regardless of race, the rater, or the outcome. Importantly, there was no two-way interaction between adolescent family SES and self-reported conscientiousness for MetS scores in Black men. Further, adjusting for MetS medications and adolescent BMI did not

substantially affect results. See Supplemental Digital Content-Results and Supplementary Table 7 for more details.

Potential MetS pathways in Black men.—This series of models tested several measures of health behaviors, stress, correlates of stress, and academic engagement and yielded three notable insights. First, there was no strong support for pathways explaining or reducing the John Henryism pattern in Black men. There were also two additional interesting patterns. We found higher social roles were associated with higher MetS scores for Black men at higher levels of SES (rather than at lower levels of SES as with conscientiousness; see Supplementary Figure 1). We also found higher adolescent aspirations were associated with lower MetS scores in Black men at higher levels of SES (most consistent with disablement, where associations between aspirations and MetS only occur in the presence of adequate resources, i.e., high SES). For more information, see Supplementary Digital Content–Results and Supplementary Figures 1 and 2.

Summary.—In summary, only self-rated conscientiousness was related to MetS in Black men, with higher conscientiousness related to higher MetS at low levels of SES (see Figure 3). Conscientiousness and SES were not significantly related to MetS in White men. This pattern of results is most consistent with John Henryism, where conscientiousness is related to worse physical health at lower levels of SES in Black men. We found this pattern to be robust to adjustment for health behaviors, several measures of stress, correlates of stress, and academic engagement.

Discussion

The purpose of the current study was to examine the role of adolescent conscientiousness in predicting adult psychological resources and MetS scores. Generally, we expected conscientiousness to predict higher psychological resources and lower MetS scores, with the possibility of moderation by race or SES. Both self-reported and parent-rated adolescent conscientiousness were associated with more psychological resources in adulthood, with no evidence of moderation. Effect sizes were small, but notable; associations (βs) for adolescent conscientiousness (0.23–0.27) typically outweighed effect sizes for adult socioeconomic status (0.07–0.26) when in the same model, despite the 16-year time lag between assessment of conscientiousness and psychological resources. Our prospective findings are consistent with prior work reporting conscientiousness is cross-sectionally associated with psychological resources (e.g., 31); we additionally show there is no disablement or buffering of these associations for individuals from socioeconomically-disadvantaged backgrounds or different ethnic groups, at least in this sample of urban Black and White men.

A more complicated but intriguing pattern of results was found for MetS. Self-reported conscientiousness was associated with higher MetS scores in Black men who were lower SES. Only the model with self-reported conscientiousness was significant in Black men, with effect sizes (βs) for conscientiousness (0.18), SES (0.11), and the interaction of conscientiousness and SES (−0.22) similar in magnitude to the effect sizes in the psychological resource models. These results are in line with John Henryism and skin-deep

resilience theories, which posit that active engagement and coping with environmental stressors (similar to conscientiousness) is related to more psychological resources but worse physiological functioning in Black men (13,14,17,18), particularly if they are lower SES. This interaction was specific to adult SES, suggesting adult Hollingshead SES is a stronger factor in understanding the John Henryism pattern than is adolescent family SES, perhaps because it was measured closer in time to MetS. It is also possible that for effortful achievement striving, “where you end up” is more important than “where you came from.” In other words, it was the Black men who—despite their high conscientiousness in adolescence—ended up in lower socioeconomic strata as adults and had higher metabolic syndrome scores.

Our study tested potential pathways that might explain this relationship, including health behaviors, stress, discrimination, emotional suppression, academic engagement, and social networks, but none of these candidate pathways substantially or robustly reduced the interaction between conscientiousness and SES for MetS scores among Black men. However, we did uncover two additional pathways that operated above the interaction of conscientiousness and SES. For Black men who were high SES, higher adolescent aspirations were associated with lower MetS scores, consistent with the disablement model (in which the benefits of adolescent aspirations only occur in the presence of resources that promote health). On the other hand, more adult social roles were associated with higher MetS scores at higher levels of SES. It may be that social roles are a psychosocial burden on Black men and consequently have a physiological cost. Future work on John Henryism should continue to explore potential pathways that explain differential associations between conscientiousness-like traits and physical and psychological well-being, and work towards an understanding of the contexts in which these pathways might operate.

An additional unexpected finding is the null results for MetS in White men, as most prior research has found that conscientiousness is related to lower MetS scores (7–9,11). One possibility is that the predictors of MetS differ by age. In support of this, one study found that income and education predicted metabolic syndrome between the ages of 25–65, but not in adolescents and older adults (51). Perhaps with additional follow-up, associations would begin to emerge. Another possibility is that the null association may be sample-specific, as there have been other unexpected null relationships for White men in this sample (cf. 52).

Results from the current study should be interpreted considering several limitations. Only boys were included in the Pittsburgh Youth Study (half of whom had more than one antisocial/delinquent behavior upon study entry). It is unclear whether results would generalize to women (13), and we do not know whether results would generalize to samples with lower risk of antisocial behavior, although we did adjust for antisocial behavior risk. The interaction between conscientiousness and SES in Black men is consistent with John Henryism theory; we did not measure John Henryism directly, but John Henryism active coping and conscientiousness are correlated and overlap conceptually (e.g., in assessment of hard work, perseverance, and motivation; 53). Future research should disentangle the relative contributions of conscientiousness versus John Henryism and other psychosocial constructs that capture effortful achievement striving to psychosocial and physical health in diverse samples.

Notwithstanding these limitations, this is the first study to prospectively test theoretically-driven, competing moderating hypotheses for conscientiousness, SES, and race on psychological resources and MetS in a racially- and socioeconomically-diverse sample. We found the benefits of adolescent conscientiousness for adult psychological resources were not moderated by race or SES. While results for MetS were most consistent with John Henryism, none of the candidate pathways explained why Black men who were conscientious as adolescents and in lower socioeconomic strata as adults were at higher cardiometabolic risk. Our study is consistent with an emerging literature suggesting that in individuals who are disadvantaged, some ostensibly adaptive characteristics may have a physical health cost. Furthermore, personality-health pathways may vary by race or socioeconomic background as well as outcome (e.g., psychological versus physical health), so interventions may not want to take a one-size-fits-all approach. Future research should not only test whether effects of conscientiousness change in socioeconomically or racially-diverse groups, but also test plausible pathways that might explain racially- and socioeconomically-based health disparities in the benefits of conscientiousness.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments

Conflicts of interest and sources of funding: This research was supported by the National Heart, Lung, and Blood Institute at the National Institutes of Health (R01HL111802, T32HL007560, L30HL143741). Data collection for the Pittsburgh Youth Study has been funded by the National Institute on Drug Abuse (DA411018), National Institute on Mental Health (MH48890, MH50778), Pew Charitable Trusts, and the Office of Juvenile Justice and Delinquency Prevention (96-MU-FX-0012). The authors have no relevant conflicts of interest to declare.

Abbreviations:

MetS	Metabolic Syndrome
CVD	Cardiovascular Disease
PYS	Pittsburgh Youth Study
SES	Socioeconomic Status
HDL	High Density Lipoprotein
BMI	Body Mass Index

References

1. Heron M Deaths: Leading Causes for 2016. Natl. Vital Stat. Reports 2018;67:1–76.
2. Grundy SM, Cleeman JI, Daniels SR, Donato KA, Eckel RH, Franklin BA, Gordon DJ, Krauss RM, Savage PJ, Smith SC, Spertus JA, Costa F. Diagnosis and management of the Metabolic Syndrome: An American Heart Association/National Heart, Lung, and Blood Institute scientific statement. Circulation. 2005;112:2735–52. [PubMed: 16157765]
3. Beltrán-Sánchez H, Harhay MO, Harhay MM, McElligott S. Prevalence and trends of metabolic syndrome in the adult U.S. population, 1999–2010. J. Am. Coll. Cardiol 2013;62:697–703. [PubMed: 23810877]

4. Shanahan MJ, Hill PL, Roberts BW, Eccles J, Friedman HS. Conscientiousness, health, and aging: The Life Course of Personality Model. Dev. Psychol 2014;50:1407–25. [PubMed: 23244406]
5. Bogg T, Roberts BW. Conscientiousness and health-related behaviors: A meta-analysis of the leading behavioral contributors to mortality. Psychol. Bull 2004;130:887–919. [PubMed: 15535742]
6. Jokela M, Pulkki-Råback L, Elovainio M, Kivimäki M. Personality traits as risk factors for stroke and coronary heart disease mortality: Pooled analysis of three cohort studies. J. Behav. Med 2014;37:881–89. [PubMed: 24203126]
7. Dermody SS, Wright AGC, Cheong J, Miller KG, Muldoon MF, Flory JD, Gianaros PJ, Marsland AL, Manuck SB. Personality correlates of midlife cardiometabolic risk: The explanatory role of higher-order factors of the Five-Factor Model. J. Pers 2016;84:765–76. [PubMed: 26249259]
8. Human LJ, Biesanz JC, Miller GE, Chen E, Lachman ME, Seeman TE. Is change bad? Personality change is associated with poorer psychological health and greater metabolic syndrome in midlife. J. Pers 2013;81:249–60. [PubMed: 22924900]
9. Sutin AR, Stephan Y, Terracciano A. Personality and metabolic dysfunction in young adulthood: a cross-sectional study. J Health Psychol 2019 3;24(4):495–501. [PubMed: 27837153]
10. van Reedt Dortland AKB, Giltay EJ, van Veen T, Zitman FG, Penninx BWJH. Personality traits and childhood trauma as correlates of metabolic risk factors: The Netherlands Study of Depression and Anxiety (NESDA). Prog. Neuropsychopharmacol. Biol. Psychiatry 2012;36:85–91. [PubMed: 22001949]
11. Hampson SE, Edmonds GW, Goldberg LR, Dubanoski JP, Hillier TA. Childhood conscientiousness relates to objectively measured adult physical health four decades later. Heal. Psychol 2013;32:925–28.
12. Hampson SE, Edmonds GW, Goldberg LR, Dubanoski JP, Hillier TA. A life-span behavioral mechanism relating childhood conscientiousness to adult clinical health. Heal. Psychol 2015;34:887–95.
13. Bennett GG, Merritt MM, Sollers JJ III, 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;19:369–83.
14. James SA, Hartnett SA, Kalsbeek WD. John Henryism and Blood Pressure Differences among Black Men. J. Behav. Med 1983;6:259–78. [PubMed: 6663614]
15. Library of Congress. “John Henry.” [cited 2018 7 15]. Available from: https://www.loc.gov/item/ihas.200196572/
16. Brody GH, Yu T, Miller GE, Ehrlich KB, Chen E. John Henryism Coping and Metabolic Syndrome Among Young Black Adults. Psychosom. Med 2018;80:216–21. [PubMed: 29140885]
17. Brody GH, Yu T, Chen E, Miller GE, Kogan SM, Beach SRH. Is resilience only skin deep? Rural African Americans’ socioeconomic status-related risk and competence in preadolescence and psychological adjustment and allostatic load at age 19. Psychol. Sci 2013;24:1285–93. [PubMed: 23722980]
18. Miller GE, Cohen S, Janicki-Deverts D, Brody GH, Chen E. Viral challenge reveals further evidence of skin-deep resilience in African Americans from disadvantaged backgrounds. Heal. Psychol 2016;35:1225–34.
19. Dunbar AS, Leerkes EM, Coard SI, Supple AJ, Calkins S. An integrative conceptual model of parental racial/ethnic and emotion socialization and links to children’s social-emotional development among African American families. Child Dev. Perspect 2016;11:16–22.
20. Krohn MD, Lizotte AJ, Perez CM. The interrelationship between substance use and precocious transitions to adult statuses. J. Health Soc. Behav 1997;38:87–103. [PubMed: 9097510]
21. Gibbons FX, Roberts ME, Gerrard M, Li Z, Beach SRH, Simons RL, Weng C-Y, Philibert RA. The impact of stress on the life history strategies of African American adolescents: Cognitions, genetic moderation, and the role of discrimination. Dev. Psychol 2012;48:722–39. [PubMed: 22251000]
22. Loeber R, Farrington DP, Stouthamer-Loeber M, Moffitt TE, Caspi A, Lynam D. Male mental health problems, psychopathy, and personality traits: Key findings from the first 14 years of the Pittsburgh Youth Study. Clin. Child Fam. Psychol. Rev 2001;4:273–97. [PubMed: 11837460]
23. Hollingshead AB. Four factor index of social status. New Haven, CT; 1975.

24. Block J, Block JH. The California Child Q-Set. Palo Alto, CA: Consulting Psychologists Press; 1980.
25. Caspi A, Block J, Block JH, Klopp B, Lynam D, Moffit TE, Stouthamer-Loeber M. A "common-language" version of the California Child Q-Set for personality assessment. Psychol. Assess 1992;4:512–23.
26. John OP, Caspi A, Robins RW, Moffitt TE, Stouthamer-Loeber M. The "Little Five": Exploring the nomological network of the Five-Factor Model of Personality in adolescent boys. Child Dev. 1994;65:160–78. [PubMed: 8131645]
27. Lynam DR, Caspi A, Moffitt TE, Raine A, Loeber R, Stouthamer-Loeber M. Adolescent psychopathy and the big five: Results from two samples. J. Abnorm. Child Psychol 2005;33:431–43. [PubMed: 16118990]
28. Barbaranelli C, Fida R, Paciello M, Di Giunta L, Vittorio Caprara G. Assessing personality in early adolescence through self-report and other-ratings a multitrait-multimethod analysis of the BFQ-C. Pers. Individ. Dif 2008;44:876–86.
29. Laverdière O, Morin AJS, St-hilaire F. Factor structure and measurement invariance of a short measure of the Big Five personality traits. Pers. Individ. Dif 2013;55:739–43.
30. Schmitt N, Golubovich J, Leong FTL. Impact of measurement invariance on construct correlations, mean differences, and relations with external correlates: An illustrative example using big five and RIASEC measures. Assessment. 2011;18:412–27. [PubMed: 20622198]
31. Watson D, Clark LA, Tellegen A. Development and validation of brief measures of positive and negative affect: The PANAS scales. J. Pers. Soc. Psychol 1988;54:1063–70. [PubMed: 3397865]
32. Scheier MF, Wrosch C, Baum A, Cohen S, Martire LM, Matthews KA, Schulz R, Zdaniuk B. The life engagement test: Assessing purpose in life. J. Behav. Med 2006;29:291–98. [PubMed: 16565785]
33. Scheier MF, Carver, Charles S, Bridges MW. Distinguishing optimism from neuroticism (and trait anxiety, self-mastery, and self-esteem): A reevaluation of the Life Orientation Test. J. Pers. Soc. Psychol 1994;67:1063–78. [PubMed: 7815302]
34. Pearlin LI, Menaghan EG, Lieberman MA, Mullan JT. The stress process. J. Health Soc. Behav 1981;22:337–56. [PubMed: 7320473]
35. Rosenberg M Society and the adolescent self-image. Princeton, NJ: Princeton University Press; 1965.
36. Boylan JM, Jennings JR, Matthews KA. Childhood socioeconomic status and cardiovascular reactivity and recovery among Black and White men: Mitigating effects of psychological resources. Heal. Psychol 2016;35:957–66.
37. Boylan JM, Cundiff JM, Jakubowski KP, Pardini DA, Matthews KA. Pathways Linking Childhood SES and Adult Health Behaviors and Psychological Resources in Black and White Men. Ann. Behav. Med 2018;1–13. [PubMed: 28762106]
38. Adult Treatment Panel III. Executive summary of the third report of the National Cholesterol Education Program (NCEP) expert panel on detection, evaluation, and treatment of high blood cholesterol in adults (Adult Treatment Panel III). J. Am. Med. Assoc 2001;285:2486–97.
39. Gurka MJ, Lilly CL, Oliver MN, Deboer MD. An examination of sex and racial/ethnic differences in the metabolic syndrome among adults: A confirmatory factor analysis and a resulting continuous severity score. Metabolism. 2014;63:218–25. [PubMed: 24290837]
40. DeBoer MD, Gurka MJ. Clinical utility of metabolic syndrome severity scores: consideration for practitioners. Diabetes, Metab. Syndr. Obes. Targets Ther 2017;10:65–72.
41. Paffenbarger RS, Wing AL, Hyde RT. Physical activity as an index of heart attack risk in college alumni. J. Epidemiol 1978;108:161–75.
42. Centers for Disease Control and Prevention. Behavioral Risk Factor Surveillance System Survey Questionnaire. Atlanta, Georgia: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention; 2011.
43. Cohen S, Kamarck T, Mermelstein R. A global measure of perceived stress. J. Health Soc. Behav 1983;24:385–96. [PubMed: 6668417]

44. Dohrenwend BS, Krasnoff L, Askenasy AR, Dohrenwend BP. Exemplification of a method for scaling life events: The PERI Life Events Scale. J. Health Soc. Behav 1978;19:205–29. [PubMed: 681735]
45. Williams DR, Yu Y, Jackson JS, Anderson NB. Racial differences in physical and mental health: Socio-economic status, stress and discrimination. J. Health Psychol 1997;2:335–51. [PubMed: 22013026]
46. Gross JJ, John OP. Individual differences in two emotion regulation processes: Implications for affect, relationships, and well-being. J. Pers. Soc. Psychol 2003;85:348–62. [PubMed: 12916575]
47. Cohen S, Doyle WJ, Skoner DP, Rabin BS, Gwaltney JM. Social ties and susceptibility to the common cold. J. Am. Med. Assoc 1997;277:1940–44.
48. Wrosch C, Scheier MF, Miller GE, Schulz R, Carver CS. Adaptive self-regulation of unattainable goals: Goal disengagement, goal reengagement, and subjective well-being. Personal. Soc. Psychol. Bull 2003;29:1494–1508.
49. Dudgeon P A Comparative Investigation of Confidence Intervals for Independent Variables in Linear Regression. Multivariate Behav. Res 2016;51:139–53. [PubMed: 27015449]
50. Cohen J, Cohen P, West SG, Aiken LS. Applied Multiple Regression/Correlation Analysis for the Behavioral Sciences. 3rd ed. Mahwah, NJ: Lawrence Erlbaum Associates; 2003.
51. Loucks EB, Magnusson KT, Cook S, Rehkopf DH, Ford ES, Berkman LF. Socioeconomic position and the Metabolic Syndrome in early, middle, and late life: Evidence from NHANES 1999–2002. Ann. Epidemiol 2007;17:782–90. [PubMed: 17697786]
52. Matthews KA, Boylan JM, Jakubowski KP, Cundiff JM, Lee L, Pardini DA, Jennings JR. Socioeconomic status and parenting during adolescence in relation to ideal cardiovascular health in Black and White men. Heal. Psychol 2017;36:673–81.
53. Stanton MV, Jonassaint CR, Williams RB, James S a. Socioeconomic status moderates the association between John Henryism and NEO PI-R personality domains. Psychosom. Med 2010;72:141–47. [PubMed: 20100884]

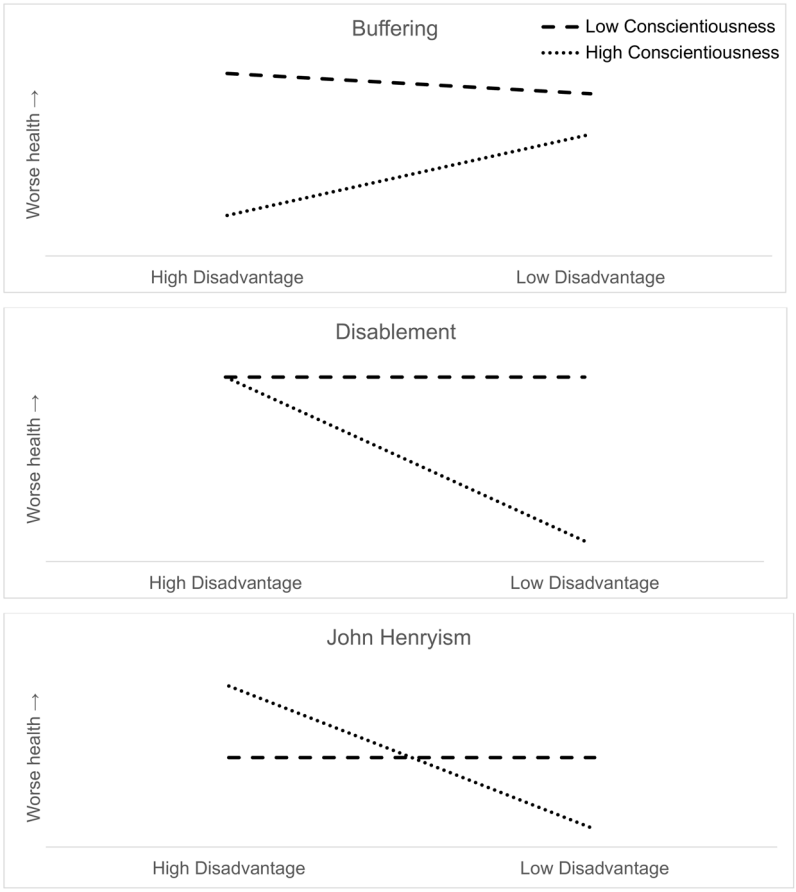

Figure 1.

A conceptual illustration of moderating hypotheses for conscientiousness and health. The X-axis is labelled “disadvantage,” which in this study refers to high disadvantage as being Black and/or low SES, and low disadvantage being White and/or high SES.

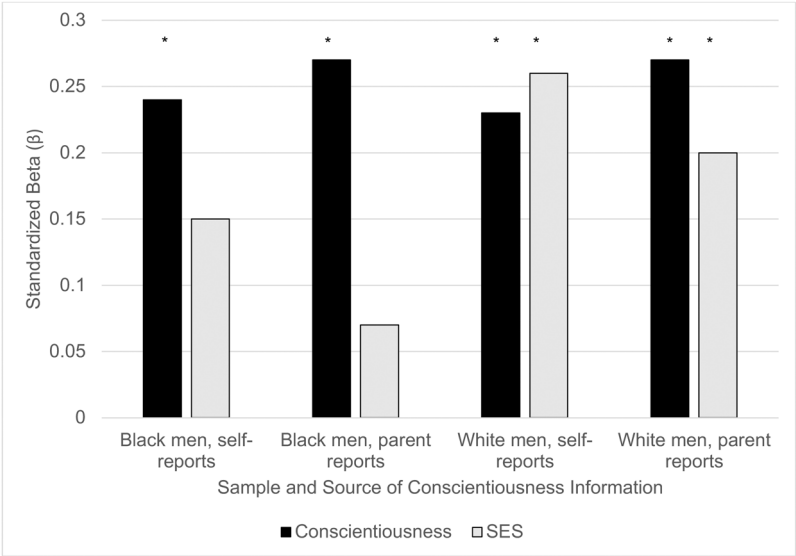

Figure 2.

Standardized beta weights for conscientiousness and SES predicting psychological resources in Black and White men, separately by rater and race. Results shown are from the model which includes adolescent conscientiousness, juvenile antisocial/delinquent behavior risk score, and adult SES predicting adult psychological resources separately by race and rater (i.e., the same model is used for comparison purposes; note that the final model selected for parent-rated conscientiousness did not include SES). Effect sizes for juvenile antisocial/delinquent behavior risk score (control variable) are omitted for ease of presentation. Statistically significant ($p \leq .050$) parameter estimates are starred.

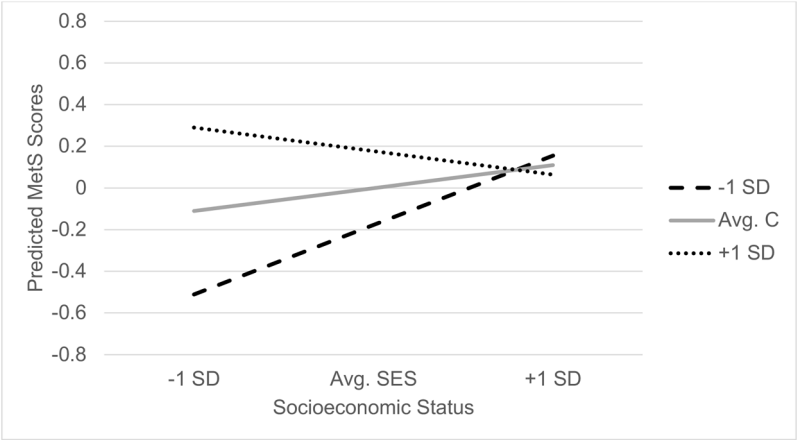

Figure 3.

High adolescent conscientiousness is associated with higher adult MetS scores in Black men who are low SES.

Table 1.

Descriptives.

Variable	Full sample (*N*=220)		Black (*N*=120)		White (*N*=100)	
	N	*M* (*SD*) or %	*N*	*M* (*SD*) or %	*N*	*M* (*SD*) or %
Adolescent measures						
Risk						
Low	111	50.45	55	45.83	56	56.00
High	109	49.55	65	54.17	44	44.00
Family SES	220	40.00 (9.22)	120	38.32 (8.42)	100	42.03 (9.76)
Self-reported conscientiousness	220	0.81 (0.22)	120	0.83 (0.19)	100	0.78 (0.24)
Parent-rated conscientiousness	220	0.71 (0.27)	120	0.71 (0.26)	100	0.70 (0.28)
Adult measures						
SES	220	31.95 (15.30)	120	27.95 (14.26)	100	36.74 (15.18)
Psychological resource composite	220	−0.02 (0.55)	120	0.01 (0.56)	100	−0.06 (0.54)
Psychological Resources Components						
Positive affect	220	35.38 (7.10)	120	36.62 (7.13)	100	33.89 (6.81)
Purpose in life	218	19.31 (2.83)	120	19.15 (2.97)	98	19.50 (2.66)
Optimism	218	11.09 (3.28)	120	11.15 (3.15)	98	11.02 (3.45)
Self-mastery	218	26.81 (4.84)	120	26.96 (4.90)	98	26.62 (4.78)
Self-esteem	219	22.63 (5.04)	120	22.54 (5.08)	99	22.74 (5.02)
BMI	199	29.95 (7.70)	116	30.23 (7.54)	83	29.56 (7.96)
MetS Score	195	−0.003 (0.63)	114	−0.03 (0.66)	81	0.04 (0.58)
MetS Components						
Glucose (mg/dl)	195	95.93 (28.18)	114	94.5 (24.90)	81	97.95 (32.29)
Triglycerides (mg/dl)	194	126.45 (94.12)	113	114.96 (98.38)	81	142.48 (85.89)
HDL (mg/dl)	195	46.67 (13.33)	114	48.15 (14.72)	81	44.59 (10.85)
Waist circumference (cm)	194	96.38 (17.02)	113	96.22 (17.35)	81	96.6 (16.64)
Systolic blood pressure (mm Hg)	193	122.59 (12.08)	112	124.43 (12.23)	81	120.05 (11.47)
Health behavior and obesity measures						
MetS medications						
No	203	92.27	111	92.50	92	92.00
Yes	17	7.73	9	7.50	8	8.00
Smoking status						
Non-smoker or former smoker	107	48.64	50	41.67	57	57.00
Light smoker	73	33.18	57	47.50	16	16.00
Heavy smoker	40	18.18	13	10.83	27	27.00
Physical activity (weekly kcal, *ln*)	220	6.63 (1.12)	120	6.66 (1.16)	100	6.60 (1.07)
Fruit/vegetable intake (no. weekly servings)	220	16.61 (12.80)	120	16.95 (14.86)	100	16.20 (9.83)
Adolescent BMI (kg/m^2)	215	23.91 (4.53)	118	24.20 (4.59)	97	23.55 (4.45)
Stress and correlates of stress						
Self-reported stress	220	5.49 (3.08)	120	5.37 (3.03)	100	5.64 (3.15)
Stressful life events	219	2.79 (2.19)	120	3.13 (2.33)	99	2.38 (1.94)

Variable	Full sample (*N*=220)		Black (*N*=120)		White (*N*=100)	
	N	*M* (*SD*) or %	*N*	*M* (*SD*) or %	*N*	*M* (*SD*) or %
Discrimination	219	17.94 (6.59)	120	18.94 (6.84)	99	16.73 (6.09)
Emotional suppression	216	9.58 (2.01)	118	9.78 (2.16)	98	9.35 (1.81)
Goal disengagement	217	10.66 (2.51)	119	10.29 (2.27)	98	11.10 (2.73)
Social roles	220	5.83 (1.89)	120	5.77 (1.82)	100	5.91 (1.98)
Academic Engagement						
Academic achievement	220	1.84 (0.51)	120	1.75 (0.48)	100	1.94 (0.53)
Aspirations	220	10.44 (3.03)	120	10.77 (3.05)	100	10.06 (2.98)
Expectations	220	12.15 (4.18)	120	12.36 (4.28)	100	11.89 (4.07)

Note. SES=Hollingshead socioeconomic status index. MetS=Metabolic syndrome score. HDL = High density lipoprotein. HDL scores were reversed in the computation of the continuous MetS score.

Table 2.

Correlations among primary study measures.

Variable	Risk	Self-reported C	Parent-rated C	SES	Psychological resources	MetS Scores
Full Sample: *r* [95% CI]						
Race	−.10 [−.23, .03]	−.11 [−.24, .03]	−.01 [−.14, .13]	**.29 [.16, .40]**	−.06 [−.20, .07]	.06 [−.08, .20]
Risk		−.03 [−.16, .10]	**−.14 [−.26, −.004]**	**−.18 [−.30, −.05]**	**−.18 [−.31, −.05]**	.01 [−.13, .15]
Self-reported C			**.29 [.16, .41]**	.04 [−.09, .18]	**.26 [.14, .38]**	**.16 [.02, .30]**
Parent-rated C				**.31 [.19, .43]**	**.33 [.21, .44]**	−.02 [−.16, .12]
SES					**.21 [.08, .33]**	.04 [−.10, .18]
Psychological resources						.07 [−.07, .21]
Black men: *r* [95% CI]						
Risk		−.01 [−.19, .16]	−.08 [−.25, .11]	−.12 [−.29, .06]	**−.19 [−.35, −.01]**	.06 [−.12, .24]
Self-reported C			.15 [−.03, .32]	.01 [−.17, .19]	**.24 [.07, .41]**	**.25 [.07, .41]**
Parent-rated C				**.30 [.13, .46]**	**.31 [.13, .46]**	−.05 [−.23, .13]
SES					.18 [−.004, .34]	.08 [−.11, .26]
Psychological resources						.07 [−.12, .25]
White men: *r* [95% CI]						
Risk		−.06 [−.26, .13]	**−.21 [−.39, −.01]**	**−.20 [−.38, −.002]**	−.19 [−.37, .01]	−.06 [−.27, .16]
Self-reported C			**.42 [.24, .56]**	.14 [−.06, .33]	**.28 [.08, .45]**	.07 [−.15, .29]
Parent-rated C				**.36 [.17, .52]**	**.36 [.17, .52]**	.03 [−.19, .24]
SES					**.32 [.13, .48]**	−.06 [−.28, .16]
Psychological resources						.09 [−.13, .30]

Note. C=conscientiousness. SES=Hollingshead socioeconomic status index. MetS=Metabolic syndrome score. All correlations are Pearson correlations, except for the correlation of race and risk group in the full sample (Spearman). Statistically significant ($p \leq .050$) correlations are bolded for emphasis, and 95% confidence intervals are provided.

Table 3.

Correlations between self- and parent-rated conscientiousness and specific psychological resources.

Measure of Conscientiousness	Positive Affect	Optimism	Life Engagement	Self-Mastery	Self-Esteem
Full-sample: *r* [95% CI]					
Self-reported C	**.18 [.05, .30]**	**.15 [.02, .28]**	**.21 [.07, .33]**	**.25 [.12, .37]**	**.18 [.05, .31]**
Parent-rated C	**.25 [.12, .37]**	**.37 [.25, .48]**	**.30 [.18, .42]**	**.34 [.22, .45]**	**.28 [.16, .40]**
Black men: *r* [95% CI]					
Self-reported C	.12 [−.06, .29]	**.21 [.04, .38]**	**.34 [.17, .49]**	**.23 [.05, .39]**	**.20 [.02, .37]**
Parent-rated C	**.20 [.02, .36]**	**.39 [.22, .53]**	**.37 [.21, .52]**	**.36 [.19, .50]**	**.29 [.12, .45]**
White men: *r* [95% CI]					
Self-reported C	**.21 [.01, .39]**	.09 [−.11, .29]	.08 [−.12, .27]	**.27 [.08, .45]**	.18 [−.02, .36]
Parent-rated C	**.32 [.13, .49]**	**.36 [.17, .52]**	**.22 [.02, .40]**	**.33 [.13, .49]**	**.27 [.08, .45]**

Note. C=conscientiousness. All correlations are Pearson correlations. Statistically significant ($p \leq .050$) correlations are bolded for emphasis, and 95% confidence intervals are provided.

Table 4.

Regression models for MetS scores in Black and White men.

Statistic	Black men		White men	
	Self-reported C	Parent-rated C	Self-reported C	Parent-rated C
Overall model statistics and Adjusted R^2	$F(4, 109)=3.66$, $p=.008$ .0860	$F(4, 109)=0.52$, $p=.72$ 0	$F(4, 76)=0.30$, $p=.88$ 0	$F(4, 76)=0.55$, $p=.70$ 0
Intercept	$b=-0.03$ [−0.15, 0.09] β=0, $p=.63$	$b=-0.03$ [−0.17, 0.11] β=0, $p=.70$	$b=0.06$ [−0.08, 0.20] β=0, $p=.40$	$b=0.07$ [−0.07, 0.21] β=0, $p=.29$
Conscientiousness	$b=0.60$ [−0.04, 1.25] β=0.18, $p=.066$	$b=-0.14$ [−0.74, 0.45] β=−0.06, $p=.63$	$b=0.18$ [−0.36, 0.73] β=0.08, $p=.50$	$b=0.07$ [−0.44, 0.57] β=0.03, $p=.79$
Risk	$b=0.06$ [−0.06, 0.17] β=0.09, $p=.35$	$b=0.05$ [−0.08, 0.17] β=0.07, $p=.45$	$b=-0.04$ [−0.18, 0.09] β=−0.07, $p=.53$	$b=-0.04$ [−0.18, 0.09] β=−0.07, $p=.55$
SES	$b=0.01$ [−0.003, 0.01] β=0.11, $p=.23$	$b=0.005$ [−0.01, 0.01] β=0.10, $p=.34$	$b=-0.004$ [−0.01, 0.01] β=−0.09, $p=.45$	$b=0.005$ [−0.01, 0.01] β=−0.06, $p=.62$
Conscientiousness × SES	$b=-0.05$ [−0.09, −0.01] β=−0.22, $p=.022$	$b=0.01$ [−0.03, 0.05] β=0.04, $p=.74$	$b=-0.003$ [−0.04, 0.03] β=−0.02, $p=.88$	$b=-0.02$ [−0.06, 0.02] β=−0.13, $p=.25$

Note. C=conscientiousness. SES=Hollingshead socioeconomic status index. MetS=Metabolic syndrome score. For each variable, betas and their 95% confidence intervals are presented, as well as standardized betas and associated *p* values. Models for parent-rated conscientiousness in Black men and self-reported and parent-rated conscientiousness in White men are non-significant and presented for comparison.