

Supplementary materials to Albanese et al. (CARDIA study)

METHODS

1. **Composite cognitive score calculations** - Composite cognitive score was computed by adding up sex-specific standardized Z-scores (individual value of $x - \text{mean of } x / \text{SD of } x$) of the three cognitive measures (i.e. Rey Auditory Verbal Learning Test (RAVLT)¹; the Digit Symbol Substitution Test (DSST)², and the modified Stroop Test interference score³. Z-scores were calculated so the different test scores could be summed to yield the overall composite cognitive score. This composite score was used in our main analysis because composite cognitive scores have better psychometric properties than individual tests and have been widely used in previous research.⁴

2. **Personality traits** – Hostile attitude, measured with the Cook-Medley scale, and effortful coping, John Henryism Scale for Active Coping (JHAC12) scale, were ascertained at baseline in all participants (Year 0, 1985). These measures have been used in population-based studies,^{5,6} were previously reported to be associated with cardiovascular outcomes in the CARDIA study,⁷ and are related to stress responses.^{8,9}
 - **Hostile attitude:** The Hostility scale (range 0-50) encompasses six subsets (cynicism, hostile attribution and affect, aggressive responding, social withdrawal and other/ miscellaneous). Hostility was measured with the Cook-Medley scale (part of the Minnesota Multiphasic Personality Inventory, MMPI) that encompasses six subsets (cynicism, hostile attribution and affect, aggressive responding, social withdrawal and other/ miscellaneous) based on agreement with 50 statements, for example “it is safer to trust nobody” and “I tend to be on my guard with people who are somewhat friendlier than I had expected”.¹⁰ A global score (range 0 to 50) is obtained computing yes (=1) and no (=0) answers. The psychometric properties of the Cook-Medley scale have been assessed including in bi-racial community samples.¹¹

 - **John Henryism:** The John Henryism Scale for Active Coping (JHAC12) measures the maladaptive predisposition to cope in an effortful manner with chronic and persistent stressors.¹² Participants rated their agreement with 12 statements using a Likert scale ranging from 1 (strong disagree) to 5 (strong agree). Sample items are “I like doing things that other people thought could not be done”; “I feel that I am the kind of individual who stands up for what he believes in, regardless of the consequences”. The resulting score ranged from 12 to 60 with high scores representing more effortful coping. The JHAC12 is a valid and reliable measure of effortful coping,¹³ which may be associated with higher sustained psychological distress through dysregulated stress responses.⁹

3. **Covariates** – In the main analysis we accounted for cumulative exposure to cardiovascular risk in adulthood combining the following cardiovascular risk factors (CVRF) measured at each exam, and known from our previous studies to be associated with cognitive function:¹⁴ obesity (body mass index, BMI, > 30 kg/m²); hypertension (resting systolic blood pressure (SBP) ≥140 and/or diastolic BP (DBP) ≥90 mm Hg and/or current use of antihypertensive medications); and diabetes mellitus (DM, fasting glucose ≥7.0 mmol/l (126 mg/dl), except at Year 2 and 5, and/or taking oral hypoglycemic medications or insulin or self-reported clinical diagnosis). The three CVRF were combined into a cumulative score assigning one point to each risk factor at each follow-up and adding them up. The CVRF score ranged from 0 (i.e., never obese, hypertensive or diabetic) to 22 (maximum possible score = 24, 3 times 8). Those with less than five available repeated measures (out of eight) were excluded (n = 17) and missing values were imputed carrying forward the last available observation in those with more than five but less than eight observations (n=38).

References

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