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# Socioeconomic disadvantage and high-effort coping in childhood: evidence of skin-deep resilience

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**Background:** Low socioeconomic status (SES) is a risk factor for poor outcomes across development. Recent evidence suggests that, although psychosocial resilience among youth living in low-SES households is common, such expressions of resilience may not extend to physical health. Questions remain about when these diverging mental and physical health trajectories emerge. The current study hypothesized that skin-deep resilience – a pattern wherein socioeconomic disadvantage is linked to better mental health but worse physical health for individuals with John Henryism high-effort coping – is already present in childhood. **Methods:** Analyses focus on 165 Black and Latinx children ($M_{age}$ = 11.5) who were free of chronic disease and able to complete study procedures. Guardians provided information about their SES. Children reported on their John Henryism high-effort coping behaviors. They also provided reports of their depressed and anxious mood, which were combined into a composite of internalizing symptoms. Children's cardiometabolic risk was captured as a composite reflecting high levels of systolic or diastolic blood pressure, waist circumference, HbA1c, triglycerides, and low high-density lipoprotein cholesterol. **Results:** Among youth who reported using John Henryism high-effort coping, SES risk was unrelated to internalizing symptoms and was positively associated with cardiometabolic risk. In contrast, for youth who did not engage in high-effort coping, SES risk was positively associated with internalizing symptoms and was unrelated to cardiometabolic risk. **Conclusions:** For youth with high-effort coping tendencies, socioeconomic disadvantage is linked to cardiometabolic risk. Public health efforts to support at-risk youth must consider both mental and physical health consequences associated with striving in challenging contexts. **Keywords:** Skin-deep resilience; cardiometabolic risk; internalizing symptoms; socioeconomic status risk; high-effort coping.

## Introduction

Although the risks associated with growing up in stressful environments are well characterized (Appleyard, Egeland, van Dulmen, & Sroufe, 2005; Shonkoff et al., 2012), many children who face poverty, inadequate resources, and other adversities demonstrate remarkable resilience, as evidenced by good mental health, academic and professional success, and avoidance of excessive substance use or risk-taking behaviors. Studies of resilient youth highlight the promising notion that growing up in an underserved environment is not necessarily deterministic of one's future outcomes in life. In fact, resilience may reflect the 'ordinary magic' of caring and supportive adults, an internal drive to succeed, and social safety nets that, to varying degrees, can offset some of the most negative consequences of early adversity (Masten, 2001, 2015).

This optimistic picture of children's abilities to persevere and thrive in impoverished settings and develop into healthy adults has been challenged in the last decade, however. Recent studies have shed light on what may be health *costs* associated with achieving academic success and psychological well-being in adverse socioeconomic conditions, a phenomenon known as 'skin-deep resilience' (Brody et al., 2013). Specifically, John Henryism theory suggests that high levels of self-control, goal-directed behavior, and high-effort coping may undermine physical health (James, 1994), even as these coping behaviors support psychosocial well-being. The first evidence for these diverging mental and physical health trajectories came from a longitudinal study of young African-American adults living in the rural South. Although self-control in early adolescence was linked to better mental health in young adulthood, such resilience did not translate to markers of physical health. In fact, for youth growing up in the most disadvantaged environments, self-control was linked to faster epigenetic aging of immune cells, greater risk of metabolic syndrome, and more insulin resistance in adulthood (Brody et al., 2013; Brody, Yu, Chen, & Miller, 2020; Miller, Yu, Chen, & Brody, 2015). Similar evidence has emerged in nationally representative samples (Brody, Yu, Miller, & Chen, 2016; Gaydosh, Schorpp, Chen, Miller, & Harris, 2018), including one study that leveraged a

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co-twin control design to account for shared genetic and environmental effects (Chen et al., 2020). To date, evidence for skin-deep resilience has been found mostly in samples of color but less consistently so in White samples (Gaydosh, Schorpp, et al., 2018).

Much of this work to date has focused on longitudinal studies of youth who are followed into adulthood, when various physical health measures and biomarkers are collected. In many ways, these rigorous study designs with samples of adults who have been participating in research since childhood are a sensible starting point for evaluating questions about the limits of resilience. By adulthood, the accumulation of unhealthy behaviors, such as diets high in fat or sugar, inadequate sleep, and insufficient restorative health behaviors has likely started to manifest in ways that are detectable on clinical measures of physical health [e.g. elevated blood pressure (BP), dyslipidemia, central adiposity]. Still, such focus on physical health in *adulthood* leaves several questions about the developmental course of skin-deep resilience and the boundary conditions that might constrain the extent to which one would expect to find evidence of this phenomenon. For example, how early in development is skin-deep resilience detectable? What markers of mental and physical health illustrate these diverging trajectories? Answers to these questions will shed light on unresolved discussions about the ideal timing for implementing policies and practices that aim to increase upward socioeconomic mobility and mitigate risk for subsequent health conditions like diabetes and coronary heart disease.

Collectively, these studies suggest that, among youth of color who engage in high-effort coping and exhibit high self-control, socioeconomic disadvantage is unrelated to or is associated with better mental health but worse physical health in adulthood. The present study was designed to explore this patterning in the youngest sample of youth tested to date (8–16 years). Measures include internalizing symptoms (i.e. depressive and generalized anxiety symptoms) as well as a composite of dimensions of cardiometabolic risk (i.e. BP, central adiposity, dysglycemia, and dyslipidemia). Although childhood and adolescence are generally viewed as healthy periods of development, the precursors to chronic disease emerge during these stages, and onset of cardiometabolic dysregulation by age 9 is associated with a greater risk for early onset of chronic diseases in adulthood (Juonala et al., 2011). We hypothesized that, among youth reporting high levels of John Henryism high-effort coping strategies, SES risk would be unrelated to mental health or would be associated with *fewer* mental health symptoms. In contrast, we expected that socioeconomic disadvantage would be positively associated with cardiometabolic risk for youth with high levels of John Henryism coping tendencies.

## Methods

### Participants and study design

Children from the surrounding Athens, GA community were recruited through local advertisements, community liaisons, and snowball recruiting with the support of existing participants in the study. To be eligible, children had to be between the ages of 8 and 16, English-speaking, identify as either Black or Hispanic/Latinx, and in good health, defined as: (a) without a history of chronic immune-related diseases, such as diabetes, sickle cell anemia, or rheumatoid arthritis and (b) without acute infections for 4 weeks. Data collection took place between July 2021 and May 2022. Guardians (93% mothers, 4% fathers, and 3% other) provided written consent, and children provided written assent. The Institutional Review Board at the University of Georgia approved all study protocols. Children and their guardian each received $50 for participating in the study, along with $20 for transportation.

Although 167 were enrolled in the study, we determined that one child had untreated diabetes (hemoglobin A1C [HbA1c] value of 15.7%), and one family was unable to complete the study procedures, resulting in a final analytic sample of 165 ($M_{age}$ = 11.5, $SD$ = 2.6; 49% girls; 60% Black/African American; 40% Hispanic/Latinx).

### Procedures

Children and their guardians completed a baseline assessment in the lab as part of a larger 1-year longitudinal study focused on risk and resilience in youth of color. Trained research assistants administered surveys and cognitive tasks and performed biometric assessments (e.g. height, weight, waist and hip circumference, BP). Certified phlebotomists performed all blood draws. For younger children in the study who requested assistance, a research assistant read questionnaires to participants and helped clarify any confusing language. For Spanish-speaking parents, measures were translated and a research assistant was available for any needed clarifications.

### Measures

*Socioeconomic status (SES) risk.* Caregivers provided data on their families' SES. Six dichotomous variables formed a socioeconomic risk index, which was based on previous research (Brody, Yu, Miller, Ehrlich, & Chen, 2018). A score of 1 was assigned to each of the following: poverty based on federal guidelines, primary caregiver unemployment, receipt of government assistance (e.g. Temporary Assistance for Needy Families, Supplemental Nutrition Assistance Program benefits), primary caregiver single parenthood, primary caregiver education level less than high school graduation (or GED equivalent), and caregiver reported inadequacy of family income. Scores were summed to form a single risk index, which ranged from 0 to 6 ($M$ = 2.57, $SD$ = 1.39).

*John Henryism high-effort coping.* Children reported on their John Henryism high-effort coping strategies using the 12-item John Henryism Active Coping Scale (James, 2002). Items emphasize mental and physical determination, a commitment to hard work, and a single-minded determination to succeed despite challenges ($\alpha$ = .80). Items include 'in the past, even when things got really tough, I never lost sight of my goals', 'hard work has really helped me get ahead in life', and 'once I make up my mind to do something, I stay with it until the job is completely done'. Response options range from 1 (completely false) to 5 (completely true).

*Internalizing symptoms.* Children reported on their depressive symptoms using the Center for Epidemiologic

Studies – Depression short form (Andresen, Carter, Malmgren, & Patrick, 1994; Radloff, 1977; CES-D). This 10-item questionnaire asks participants to report about their depressive symptoms over the past week (α = .69, *M*[*SD*] = .80 [.48]). Response options ranged from 0 (rarely or none of the time; less than 1 day) to 3 (all of the time; 5–7 days). Additionally, children reported on their generalized anxiety symptoms using the corresponding subscale from the Spence Children's Anxiety Scale (Spence, 1997; α = .80, *M*[*SD*] = 1.1 [.71]). This subscale, which has been validated for use with children and teens, contains six items that reflect general worries, and includes items such as 'I worry about things', 'I feel afraid', and 'I worry that something bad will happen to me'. Response options ranged from 0 (never) to 3 (always). Because these measures were highly correlated ($r$ = .58, $p$ < .001), we standardized children's scores on each measure and created a mean score reflecting their internalizing mental health symptoms.

*Cardiometabolic risk composite.* Cardiometabolic risk was measured using the following criteria: systolic and diastolic BP, waist circumference, high-density lipoprotein (HDL) cholesterol, triglycerides, and HbA1c. Research assistants collected three readings for children's BP (OMRON IntelliSense BP Monitor HEM-907XL). Because the first reading can be artificially elevated, only the final two readings were averaged to create BP estimates (Negroni-Balasquide et al., 2016). BP cutoffs were determined based on age, sex, and height percentiles, following guidelines from the American Academy of Pediatrics (Flynn et al., 2017). Children under 13 years old met the cutoff if their systolic or diastolic BP was ≥90th percentile. Children aged 13 and older met the cutoff if their systolic BP was ≥120 or their diastolic BP was ≥80. Researchers measured waist circumference twice at the midpoint of the upper iliac crest and lower costal margin at the midaxillary line. If the first two measurements were more than 1 cm apart, researchers measured waist circumference a third time. The average of the closest two readings was calculated. Waist circumference cutoffs were determined based on age and sex percentiles following guidelines from the International Diabetes Federation (Alberti et al., 2007; Fernández, Redden, Pietrobelli, & Allison, 2004).

Children were asked not to eat or drink for 2 h prior to the appointment. Samples were couriered to the local hospital's CLIA-certified laboratory. HDL cholesterol and triglycerides were assessed using standard enzymatic techniques on a Beckman Coulter AU5800 chemistry analyzer. HbA1c was measured using the Bio-Rad D-10. We used established cutoffs to represent low HDL cholesterol (<40 mg/dl), elevated triglycerides (≥150 mg/dl), and elevated HbA1c (≥5.7%; Alberti et al., 2007; Zimmet et al., 2007).

We created binary variables for each component (systolic and diastolic BP, waist circumference, HDL cholesterol, triglycerides, and HbA1c) reflecting whether participants met the specified cutoffs. These scores were then summed to generate an overall metabolic risk sum score, where higher scores indicated greater risk (Magge et al., 2017). In this sample, scores ranged from 0 to 4 ($M$ = 1.02, $SD$ = .93).

## Results

Analyses were tested using multivariable regressions with Hayes' PROCESS Macro (v4.1, Model 1) in SPSS. In all analyses, age, race/ethnicity, and sex were included as covariates. Continuous variables were centered prior to analysis. Table 1 presents descriptive statistics and bivariate correlations for the sample.

### *Psychosocial outcomes*

Our first analysis examined whether the association between SES risk and children's mental health varied as a function of their John Henryism high-effort coping. A significant SES Risk × John Henryism interaction emerged ($b$ = −.25, $SE$ = .09, $p$ = .009; see Table 2). To interpret this effect, we plotted the estimated levels of internalizing symptoms by SES risk at low (1 $SD$ below the mean), average (at the mean), and high (1 $SD$ above the mean) levels of John Henryism (see Figure 1). For youth with low levels of John Henryism (−1 $SD$), exposure to SES risk was positively associated with internalizing symptoms (conditional effect = .20, $SE$ = .08, $p$ = .02). For youth with average or high levels of John Henryism, there was a negative but nonsignificant association between SES risk and children's internalizing symptoms (conditional effect for +1 $SD$ = −.11, $SE$ = .07, $p$ = .11).

### *Cardiometabolic risk outcomes*

We used the same approach described above to test whether the association between SES risk and children's cardiometabolic risk varied as a function of John Henryism high-effort coping. Analyses revealed a significant SES Risk × John Henryism interaction ($b$ = .22, $SE$ = .10, $p$ = .03; see Figure 2). For youth with average or low levels of John Henryism, there was a negative but nonsignificant association between SES risk and cardiometabolic risk (conditional effect for −1 $SD$ = −.12, $SE$ = .09, $p$ = .16). In contrast, among youth with high levels of John Henryism, SES risk was positively associated with cardiometabolic risk (conditional effect = .16, $SE$ = .09, $p$ = .047).

## Discussion

This study is the first to observe evidence of skin-deep resilience in a sample of Black and Latinx children and early adolescents aged 8–16, which suggests that the physical toll of resilience does not take decades to emerge but is present in childhood as youth of color are navigating disadvantaged environments. Among children with high levels of John Henryism high-effort coping, SES risk was unrelated to children's mental health but was positively associated with their cardiometabolic risk. For children who did not report using high-effort coping strategies, they had a different but still diverging pattern of mental and physical health: For these children, SES risk was positively associated with internalizing mental health symptoms but was unrelated to their cardiometabolic dysregulation. Unexpectedly, there was no main effect of SES risk on cardiometabolic risk. Although surprising, the lack of a main effect may reflect the low proportion of youth in our sample with significant

**Table 1** Descriptive statistics and correlations among study variables ($N$ = 165)

| Variable | *M* (*SD*) | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|---|
| 1. Age | 11.5 (2.6) | 1 | | | | | | |
| 2. Sex | .49 (.50) | −0.04 | 1 | | | | | |
| 3. Race | 1.4 (.49) | −0.01 | −0.01 | 1 | | | | |
| 4. SES Risk | 2.6 (1.4) | −0.03 | −0.09 | −.21** | 1 | | | |
| 5. JH Active Coping | 3.9 (.63) | 0.01 | −0.06 | 0.01 | 0.06 | 1 | | |
| 6. Internalizing Symptoms | .00 (.89) | −0.12 | 0.07 | −0.02 | 0.03 | −0.10 | 1 | |
| 7. Cardiometabolic Risk | 1.02 (.93) | −0.01 | −0.01 | −0.02 | 0.04 | −0.04 | −0.09 | 1 |

SES, socioeconomic status; JH, John Henryism. Sex (0 = male, 1 = female); Race (1 = Black, 2 = Hispanic).
**$p$ < .01.

**Table 2** Regression analyses of SES risk and John Henryism high-effort coping predicting internalizing symptoms and cardiometabolic risk in youth

| | *b* | SE | 95% CI |
|---|---|---|---|
| Children's internalizing symptoms | | | |
| Age | −0.03 | 0.03 | (−0.09, 0.02) |
| Sex | 0.14 | 0.14 | (−0.13, 0.41) |
| Race | −0.01 | 0.14 | (−0.30, 0.27) |
| SES risk | 0.04 | 0.05 | (−0.06, 0.14) |
| John Henryism | −0.14 | 0.11 | (−0.36, 0.07) |
| SES Risk × John Henryism | −0.25** | 0.09 | (−0.43, −0.06) |
| Children's Cardiometabolic risk | | | |
| Age | −0.009 | 0.03 | (−0.07, 0.05) |
| Sex | −0.035 | 0.15 | (−0.32, 0.26) |
| Race | −0.01 | 0.15 | (−0.31, 0.29) |
| SES risk | 0.018 | 0.05 | (−0.09, 0.13) |
| John Henryism | −0.065 | 0.12 | (−0.29, 0.16) |
| SES Risk × John Henryism | 0.22* | 0.1 | (0.02, 0.42) |

All analyses were conducted in SPSS using Hayes' PROCESS Macro Version 4.1. Race was dummy-coded as Black (1)/Hispanic/Latinx(2).Sexwasdummy-codedasmale(0)/female(1).
*$p$ < .05.
**$p$ < .01.

cardiometabolic dysregulation (e.g. only 15% of the sample met criteria for elevated triglycerides, and only 12% of the sample met the cutoff for low HDL cholesterol). Because we restricted our sample eligibility to include children who did not already have a diagnosed chronic disease, we may have limited our ability to detect the main effects of SES on the markers of physical health in the present study.

Due to funding constraints, we also restricted our study population to Black and Latinx youth, partly because some studies have found that the skin-deep resilience pattern was present more consistently among individuals of color (Brody, Yu, Miller, et al., 2016; Gaydosh, Schorpp, et al., 2018). The reasons for this patterning by race are complex but may reflect the increasing discrimination and prejudice that resilient youth of color often face as they find themselves in increasingly White spaces (e.g. in the workplace, at universities; Colen et al., 2018). This additional discrimination-related stress may exacerbate the ongoing strain associated with upward mobility (Hudson et al., 2016).

These findings raise some disconcerting questions about the benefits and limits of resilience. Western society puts a heavy emphasis on the value of hard work and determination, particularly for individuals experiencing socioeconomic disadvantage. Although goal-directed behavior and persistence in the face of challenges are traditionally viewed as characteristics

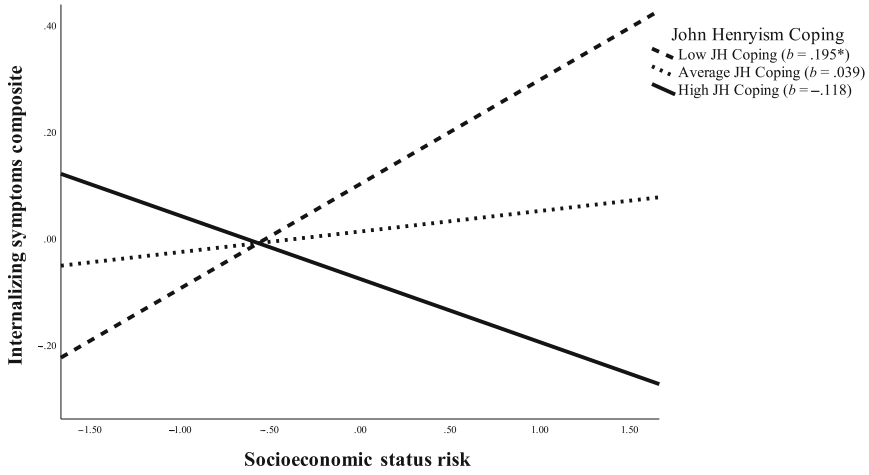


**Figure 1** Interaction between SES risk and John Henryism high-effort coping predicting internalizing mental health symptoms in youth. The figure shows estimated regression lines at ±1 *SD* and mean of children's self-reported high-effort coping behaviors

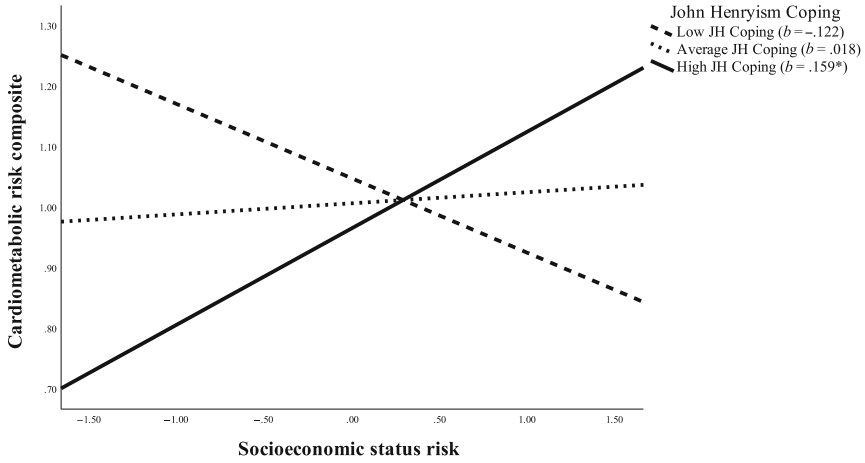


**Figure 2** Interaction between SES risk and John Henryism high-effort coping predicting cardiometabolic risk in youth. The figure shows estimated regression lines at ±1 *SD* and mean of children's self-reported high-effort coping behaviors

of resilient individuals, our analyses suggest that such a focus on achieving success may come with a heavy cost for children of color. Existing literature suggests that such goal-directed striving behaviors are associated with insulin resistance by age 27 (Brody, Yu, Chen, et al., 2020) and a greater likelihood of Type 2 diabetes by age 29 (Brody, Yu, Miller, et al., 2016) among Black participants who experienced socioeconomic disadvantage in adolescence. Our study adds to this body of research and suggests that similar cardiometabolic dysregulation begins decades earlier, in childhood. We must grapple with the uncomfortable idea that high-effort coping for disadvantaged youth of color can be a double-edged sword – one that assists children in their goal-directed pursuits but may also increase their chronic disease risk.

The present study has a number of strengths, including a diverse sample of children, the inclusion of clinical indicators of physical health, and multiple assessments of children's internalizing symptoms. Nevertheless, a handful of study limitations will be important to address in future research. First, in order to accommodate participants' busy schedules, study visits occurred primarily in the afternoon (62% of visits occurred between 2 and 5 pm), with non-fasting blood samples. Although fasting labs would have been preferred, evidence from adult studies suggests that non-fasting lipids do not vary dramatically after eating (Darras et al., 2018) and are still clinically meaningful (Bansal et al., 2007). Additionally, current analyses focus on cross-sectional evaluation of socioeconomic disadvantage, high-effort coping, and mental and physical health, and it will be important to continue this work with longitudinal designs that can better assess change over time. Further, due to sample size constraints, we were unable to test hypotheses about age or race as additional moderators. Three-way interactions require considerably larger sample sizes, and subgroup analyses will be important to address in larger cohort studies. Finally, future research should explore the possible mechanisms through which children of color with SES disadvantage and high-effort coping develop cardiometabolic dysregulation.

Public health efforts to develop and implement prevention programming for at-risk youth have been successful at reducing psychosocial risks, but growing evidence suggests that these benefits may come with a physical health cost. Our study's findings suggest that these warning signs are present early in life, which means that prevention programming *in childhood* – with an emphasis on physical and mental health promotion – will be critical for supporting well-being among youth of color who are experiencing socioeconomic disadvantage. Additionally, program evaluations should add physical health measures (e.g. cardiometabolic risk factors, inflammatory and neuroendocrine biomarkers) to the typical set of psychosocial assessments to estimate the programming's impact on youths' physical health.

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## Key points

- Skin-deep resilience – a pattern wherein high-effort coping behaviors protect individuals against the detrimental effects of socioeconomic disadvantage for mental health but amplifies the detrimental effects on physical health – has been identified in adult samples, but not in studies of children.
- Among Black/Latinx youth who engaged in 'John Henryism' high-effort coping behaviors, socioeconomic disadvantage was unrelated to internalizing symptoms but was positively associated with cardiometabolic risk.
- Our findings demonstrate that skin-deep resilience is already present in childhood. Prevention programming, which frequently emphasizes goal setting and persistence, should consider incorporating mental and physical health promotion strategies to curb chronic disease risk.

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