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Education Matters: Longitudinal Pathways to Midlife Heavy Drinking in a National Cohort of Black Americans

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Abstract

Aims: To estimate longitudinal pathways from childhood socioeconomic position (SEP) to educational attainment and midlife heavy drinking in Black Americans in order to identify potential points of early intervention to reduce risk for alcohol-related problems in adulthood.

Design, Setting, Participants: Data are from 1,299 Black Americans in the US National Longitudinal Survey of Youth, followed from 1979 (ages 15-19) through 2012. Given gender differences in factors related to education and alcohol outcomes, gender-stratified path models were analyzed.

Measurements: Youth socioeconomic indicators included parental education (approximating childhood SEP) and adolescent poverty duration. Education-related measures included high-poverty school, perceived school safety, academic problems, suspension from school, educational expectations, and educational attainment. Adulthood measures included repeated unemployment, poverty duration, and mean frequency of heavy drinking (6+ drinks/day) in young adulthood and midlife. Covariates included age, dual-parent household, marital status, early drinking onset, and family history of alcohol problems.

Findings: For both genders, two main pathways originating from low childhood SEP flowed to educational attainment through (1) educational expectations and (2) suspension, and from educational attainment to midlife heavy drinking (total indirect effect = 0.131 (95% confidence interval [CI]: .072-.197) for women, and 0.080 (.035-.139) for men). For both genders, adolescent poverty (standardized β s = 0.139, academic problems (β s = 0.221) and school suspension (β s = 0.166) were significantly (p s <.05) related to lower educational expectations. In adulthood, educational attainment was indirectly protective against midlife heavy drinking through its significant effects (p s <.05) on young adult heavy drinking for both genders (β s = -.204) and economic hardships for women (β s = -.372).

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Conflicts of Interest: None.

Conclusions: Low childhood socioeconomic position among Black Americans appears to be associated with subsequent, adverse socioeconomic and school experiences that lead to lower educational attainment and, ultimately, greater heavy drinking at midlife. Interventions that mitigate these earlier, adverse experiences might have indirect effects on midlife heavy drinking.

Keywords

Alcohol use; Heavy drinking; Racial and ethnic disparities; Black American; Racial and ethnic minority; Socioeconomic; Education; Life course; School suspension

INTRODUCTION

Black Americans in the US have high rates of childhood socioeconomic disadvantage, low rates of upward socioeconomic mobility¹, and elevated alcohol risks in adulthood. Despite greater abstinence rates, alcohol use disorder rates are similar to or exceed those of White adults², and Black Americans bear a greater burden of alcohol-related health harm, morbidity, and mortality than other racial/ethnic groups^{3,4}. Black drinkers also experience more alcohol-related problems than White drinkers⁵⁻⁷. Yet, they remain understudied in US alcohol research.

Racial disparities in health become more pronounced in middle age⁸, and thus harmful health behaviors in midlife are important to address. Our prior US longitudinal studies of Black Americans and other racial/ethnic groups suggest enduring effects of early socioeconomic disadvantage on midlife heavy drinking but also a universal protective effect of higher education on heavy drinking trajectories for both women and men^{9,10}, consistent with research on harmful drinking and alcohol problems¹¹⁻¹⁴. Specifically, each additional year of education beyond 11th grade has been shown to correspond to a reduction in adult heavy drinking frequency, with the greatest decrease found for 16 or more years of education, the equivalent of a 4-year college or Bachelor's degree¹⁵.

Although health benefits of education have been ascribed to greater cognitive skills and wages resulting from higher education^{15,16}, research has increasingly highlighted the role of noncognitive skills present earlier in life – such as behavioral and socioemotional adjustment, attention, motivation, and perseverance – in educational success, and suggested that these skills might help explain the education-health gradient observed in adulthood¹⁷⁻²⁰. Importantly, new studies suggest that children's experiences of their school environment, teachers, and activities can affect noncognitive skills linked to educational success^{21,22}. Thus, to the extent that school environments and experiences shape noncognitive skills, the former might hold relevance for educational attainment and heavy drinking years later.

The current study examined pathways to educational attainment and midlife heavy drinking in a national cohort of Black Americans. Given US educational inequalities by race, we were interested in school contexts and experiences that affect Black youth in particular (e.g., high-poverty or unsafe schools, suspension from school which excludes the student from classroom learning) and socioeconomic conditions that might affect noncognitive skills and educational attainment and, indirectly, adult heavy drinking. This longitudinal study

extends our earlier research on racial and ethnic differences in effects of early disadvantage on midlife heavy drinking (see ¹⁰) by examining whether and how such educational contexts and school experiences link early disadvantage with educational attainment and adult socioeconomic conditions and heavy drinking in Black Americans. Recognizing that educational factors could be linked to family socioeconomic position and that parental education can influence children's own educational attainment and adult health ²³, we chose parental education — a key indicator of childhood socioeconomic position (SEP) — as the starting point for this study. In addition, given reports of gender differences in factors related to education and alcohol outcomes ^{24,25}, gender-specific analyses were conducted to identify important predictors for each group.

Our study is informed by cumulative disadvantage theory and the chain of risks model from lifecourse epidemiology ²⁶ which highlight how early disadvantage can lead to further disadvantages affecting subsequent socioeconomic and behavioral determinants of health across the life course. Based on the literature, we developed a conceptual model shown in Figure 1 in which low childhood SEP (low parental education) was hypothesized to be associated with adolescents' duration of poverty and exposure to adverse school contexts (high student poverty rates and lower school safety). In the US, high-poverty schools have less school funding and resources, substandard facilities, and less experienced and underpaid teachers ²⁷; graduation rates are more than twenty percentage points below those of low-poverty schools ²⁸. Also, perceived school safety is strongly, positively associated with academic achievement ²⁹. We expected adverse school contexts and adolescent poverty duration, as a marker of chronic stress, would be associated with academic difficulties, school suspension (which is associated with poor academic performance ³⁰), and lower educational expectations, and that all three would be associated with lower educational attainment ^{31–35}. In turn, lower educational attainment was expected to be associated with greater heavy drinking in young adulthood, adult economic hardships, and heavy drinking in midlife.

METHODS

Data Source

This secondary analysis used survey data collected over a 30-year period from 1979 - 2012 from the National Longitudinal Survey of Youth 1979 (NLSY79), a nationally representative panel study of civilian, non-institutionalized, US-born youth with oversamples of racial/ethnic minority youth born in the late 1950s and early 1960s (for more information, see ³⁶). The response rate (RR) in 2012 was 79% for eligible, non-deceased individuals and retention was comparable across race/ethnicity. Use of NLSY survey weights adjusted the multi-wave survey dataset to be representative of the US population at baseline ³⁷. This analysis included 1,299 Black respondents (654 females and 645 males) ages 15 through 19 in 1979. The final path model included 1,140 respondents (see Supplemental Table S1 for sample inclusion, missing data, and sample sizes.) This study analyzed respondents' survey data, their high school's characteristics (the High School Survey was completed by school principals in 1980; RR=77%) and their high school transcripts (collected 1980-1983; RR=81%). This analysis of publicly available data was exempt from review by the

Institutional Review Board of the Public Health Institute (Oakland, California). As our primary research question and analysis plan were not pre-registered on a publicly available platform, results should be considered exploratory.

Measures

Because the analytic sample ranged in age from 15 through 19 at baseline, data were obtained from varying survey years to create measures for a specific age or age range (see Supplemental Figure S1).

Average midlife heavy drinking frequency (ages 42-52), our key outcome variable, is the number of days drinking 6+ drinks/day in the past month based on respondent self-reports averaged across up to 4 surveys conducted biennially 2006-2012. *Average young adulthood heavy drinking frequency* (ages 24-30) is the drinking frequency averaged across the annual 1988 and 1989 surveys. Following prior NLSY studies, ordinal response categories were coded using the weighted empirical means of the midpoints for each category as 0.0, 1.8 (mean of once and 2-3 times per month), 5.1 (mean of 4-5 times and 6-7 times per month), and 11.0 (mean of 8-9 times and 10 or more times per month) and treated as a continuous variable^{9,10,38}. Both heavy drinking measures were log-transformed to account for skewness.

Low childhood SEP, our main predictor, was operationalized as parental education less than a high school diploma (for both parents if a dual-parent household) reported at the 1979 baseline. *Adolescent poverty duration* was the proportion of years from ages 15-19 that parent-reported, past-year family incomes were at or below the federal poverty level (survey years 1979-1983; 15-year-olds had data from up to five years; 19-year-olds had data from 1979).

Five measures of the respondent's school context and experiences were generated from their High School Survey (HSS), high school transcript (HST) and respondent surveys (RS). *High-poverty school* (1980 HSS) was defined as having at least 75% low-income students, consistent with the National Center for Education Statistics (NCES) definition²⁸. *Unsafe school* (RS 1979) was indicated by "I don't feel safe at this school," where responses were coded from 1 "not at all true" to 4 "very true". *Academic problems* (HST) were indicated by enrollment in remedial math or English classes¹⁰. *High school suspension/expulsion* (HST), hereafter referred to as suspension, indicated any incident (yes/no). *Educational expectations* (RS 1979-82) were captured by the question, "As things stand now, what is the highest grade or year you think you will complete?" The most recent available response was used and dichotomized to indicate lower expectations (completing less than 16 years of education).

Educational attainment (RS 1988-2012) was a categorical measure indicating highest education level completed: did not receive a high school diploma by age 19, graduated high school "on time" by age 19, or received a Bachelor's degree by age 25. "On time" high school completion is associated with greater educational attainment, higher-wage employment, and health-promoting behaviors³⁹.

Adult economic hardship was indicated by *repeated unemployment* and *adult poverty duration*. Repeated unemployment was operationalized as unemployed at 2 or more interviews at ages 26-38 (RS 1990-1998, asked biennially). Recognizing potential effects of repeated unemployment on subsequent household income, adult poverty duration was assessed at older ages (36-42, RS 1996-2006) and was constructed like adolescent poverty duration.

Control variables

Early onset of alcohol use by age 14, reported retrospectively (R 1982+), is a predictor of heavy drinking in adolescence⁴⁰ and young adulthood, particularly for Black Americans⁴¹. To assess *family history of alcohol problems*, respondents were asked whether any relatives were “alcoholic or a problem drinker at any time”, and specified their relationships to up to seven alcoholic relatives (RS 1988). Following Chartier and colleagues (2017), our family history predictor was coded using a mean weighted score for all first- and second-degree relatives with alcohol problems⁴². Additional control variables included baseline age, dual-parent household at baseline, and respondent marital status. Because Mplus drops individuals with missing values on predictors, missing values on categorical predictor variables were dummy coded and included as additional control variables. Missing values for family history (continuous) were not replaced.

Analysis

Preliminary analyses included polychoric correlations of indicators and careful inspection of model assumptions^{43,44}. Gender-stratified longitudinal path models conducted in Mplus⁴⁵ tested hypothesized relationships (see Figure 1), following a model generating approach whereby a theoretically driven path model was specified and tested^{43,44}. School context indicators were allowed to correlate, as were school problem indicators (curved arrows in model figures). Based on recommended practices, preliminary analyses, model fit statistics⁴⁶⁻⁴⁸, and modification indices⁴⁹, reduced models that were theoretically sound and consistent with our conceptual model were subsequently estimated to determine a parsimonious model^{50,51} (see Figures 2 and 4 notes for model fit statistics). For each path in the overall model, non-significant control variables were trimmed to preserve degrees of freedom. The final model was re-estimated using a bias-corrected bootstrap re-sampling method to derive standard errors and confidence limits and non-symmetrical bootstrap confidence intervals for model parameter estimates^{43,52}. Models were estimated using the robust weighted least squares (WLSMV) estimator^{53,54} which accommodates missing data, handles covariance among outcomes and mediators, and provides fit indices for model evaluation⁵⁵.

Results

Table 1 shows the proportion or mean of key indicators and correlations by gender (females above the diagonal; variances are shown on the diagonal). Youth experienced substantial socioeconomic disadvantage (e.g., 43.4% had low childhood SEP and repeated poverty was common). Large proportions (43.6%) attended a high-poverty school or had lower educational expectations (56.7%). School suspension was experienced by 39.5%, which is

considerably higher than the NLSY sample overall (<25% suspended) and consistent with the US racial disparity in school suspension⁵⁶. Two-thirds (67.2%) graduated high school on time but did not attain a 4-year college degree; 22.3% did not graduate high school. Overall, 37.8% (26.7% females, 49.1% males) drank heavily in young adulthood, and 25.0% (16.4% females, 34.0% males) drank heavily at midlife (percentages not shown in Table).

For both genders, socioeconomic disadvantage, academic problems, suspension, and lower educational expectations were negatively correlated with educational attainment (all $r < -.30$). Educational attainment was negatively correlated with adult economic hardships (r 's $< -.23$). Correlates of midlife heavy drinking included young adult heavy drinking for both genders (r 's $> .27$), academic problems for males ($r = .18$), and lower educational expectations for females ($r = .32$).

Females

Figure 2 shows standardized coefficients and standard errors from the final adjusted model for the sample of women. The model achieved good fit (see Figure 2 notes) and most of the hypothesized direct effects were upheld. Low childhood SEP was strongly associated with adolescent poverty ($\beta = .607$), which was significantly associated with high-poverty school ($\beta = .175$), academic problems ($\beta = .200$), suspension ($\beta = .195$), and lower educational expectations ($\beta = .146$). Notably, suspension ($\beta = .222$) and academic problems ($\beta = .221$) were significantly related to lower educational expectations for Black adolescent girls, and two factors – lower educational expectations ($\beta = -.525$) and suspension ($\beta = -.264$) – were significantly associated with educational attainment. As expected, educational attainment was inversely associated with young adult heavy drinking frequency ($\beta = -.254$), repeated unemployment ($\beta = -.372$) and adult poverty duration ($\beta = -.513$), and these three factors were associated with midlife heavy drinking frequency (β 's = 0.359, 0.173, and 0.145, respectively). The adjusted model explained 22% of variance in Black women's midlife heavy drinking.

Significant indirect pathways from low childhood SEP to educational attainment and midlife heavy drinking were observed (total indirect effect = 0.131, 95% CI= 0.072-0.197, see Figure 3 notes). One set of pathways originating in low childhood SEP flowed through educational expectations (directly and indirectly via adolescent poverty) and educational attainment, and onward through young adult heavy drinking or adult economic hardships. Another major pathway flowed through adolescent poverty and school suspension to lower educational attainment and either young adult heavy drinking or adult poverty.

Males

Figure 4 shows results for the final model for men, with fit indices showing good model fit (see Figure 4 notes). Many hypothesized, direct effects held for males. Low childhood SEP was strongly associated with adolescent poverty ($\beta = .463$); the latter was significantly associated with high-poverty school ($\beta = .172$), academic problems ($\beta = .193$), and lower educational expectations ($\beta = .139$). For males, adolescent poverty was not associated with perceived school safety or suspension. As found for females, both academic difficulties ($\beta = .252$) and suspension ($\beta = .166$) were significantly associated with lower

educational expectations, and lower expectations ($\beta=-.491$), suspension ($\beta=-.264$), and academic problems ($\beta=-.187$) were related to educational attainment. In turn, educational attainment was negatively associated with young adult heavy drinking ($\beta=-.204$), repeated unemployment ($\beta=-.295$), and adult poverty ($\beta=-.401$). Young adult heavy drinking ($\beta=.380$) was significantly associated with midlife heavy drinking. The adjusted model explained 20% of variance in midlife heavy drinking frequency among men.

Compared to women, men evidenced fewer significant, indirect pathways from low childhood SEP to educational attainment and midlife heavy drinking (total indirect effect = .077, 95%CI=.038-.123, see Figure 5 notes). One main pathway flowed through lower educational expectations to educational attainment while another flowed through school suspension to educational attainment, and from there to young adult heavy drinking and midlife heavy drinking. Unlike women, men showed significant, residual effect of low childhood SEP on educational attainment ($\beta=-.250$).

DISCUSSION

This study investigated socioeconomic and education pathways from low childhood SEP to midlife heavy drinking for a US national cohort of Black Americans. Low childhood SEP characterized more than 40% of the sample and was associated with a sequence of adverse socioeconomic and school experiences that led to lower educational attainment and, ultimately, greater heavy drinking at midlife. For both genders, pathways to midlife heavy drinking occurred via young adult heavy drinking and, for women, also through repeated unemployment and greater adult poverty duration.

Lower educational expectations and school suspension emerged as important factors in pathways from low childhood SEP to lower educational attainment and midlife heavy drinking. For both genders, adolescent poverty, academic problems, and suspension were associated with lower expectations of educational attainment. For females, lower expectations were also associated with attending an unsafe school, and for males expectations were independently associated with low childhood SEP. In contrast to educational expectations, there were few paths to school suspension, which was associated with greater adolescent poverty duration for females and low childhood SEP for males.

Our findings are consistent with studies of racially/ethnically diverse groups indicating strong associations between educational expectations and educational attainment, and between early socioeconomic disadvantage and lower educational expectations⁵⁷⁻⁵⁹. Unlike educational aspirations, which are hope-based, expectations reflect a student's perception of likelihoods⁵⁸. In our study, academic problems and suspension (whereby students are excluded from classroom learning) were associated with lower educational expectations. Importantly, academic problems and suspension have both been linked to implicit bias against students of color⁶⁰. School-level strategies such as implicit-bias trainings and culturally relevant curricula might help to mitigate this (e.g., see⁶¹). In addition, programs that provide academic support, mentorship by adults from similar backgrounds, experiential opportunities such as college campus visits, job shadowing and training programs, and student financial aid could help broaden educational expectations of disadvantaged youth.

The Harlem Children's Zone is one prominent example of a comprehensive, multi-level program from birth to college that has increased academic achievement of disadvantaged youth and reduced racial disparities ⁶².

Our finding that suspension comprises a key pathway from low childhood SEP to lower educational attainment and midlife heavy drinking warrants special attention. Highlighting long-term consequences of suspension, a recent study matched suspended and non-suspended youth on 60 pre-suspension variables including parental SEP and youth academic problems, delinquency, and substance use. Suspended Black youth were 94% less likely to earn a Bachelor's degree in contrast to a 24% lower likelihood for suspended youth in the sample overall ⁶³. Thus, Black youth are both differentially exposed to and impacted by school suspension practices. Notably, a study of elementary school children in 20 US cities indicated that Black-White disparities in suspension were largely due to differential treatment by school personnel, followed by differences in school environments and, to a much lesser extent, behavioral differences ⁶⁴. Some school districts have replaced exclusionary discipline with restorative justice practices that hold promise for reducing disparities in both suspension and academic performance ⁶⁵. Our study supports the importance of such efforts by highlighting long-term consequences of school suspension on midlife health risk behavior for Black Americans.

Independent of these two main pathways involving educational expectations and suspension, there remained a residual, direct effect of low childhood SEP on educational attainment for men. Research on gender differences in effects of lower SEP on children's educational achievement suggests low-SEP boys may be more vulnerable than low-SEP girls to lower achievement later in childhood ²⁴. Such gender differences have been found as early as elementary school ^{24,66}.

A final notable finding concerns pathways from educational attainment to midlife heavy drinking via young adult heavy drinking and also, for women, economic hardships. Our results point to the importance of early alcohol screening and brief intervention with young adults, and suggest that interventions to reduce poverty and help sustain employment during the transition out of young adulthood might reduce Black women's heavy drinking risk later in life.

The finding that repeated unemployment and chronic poverty were significant paths to heavy drinking for Black women only is consistent with our prior studies showing that adult poverty and cumulative socioeconomic disadvantage are risk factors for heavy drinking among Black women but not Black men ^{9,25}. This might reflect differences in acceptable (unmeasured) drinking norms for women and men; that is, men's heavy drinking might be generally more influenced by permissive drinking norms. Additionally, (unmeasured) experiences of racial discrimination might significantly influence Black men's drinking (e.g., see ^{7,67}). If true, this might help explain why paths from acute economic hardships to heavy drinking were weaker in men than women.

This study has notable strengths, including the use of multiple data sources and prospective analysis across more than three decades. But several study limitations should be borne in

mind. WLSMV assumes missing at random with respect to covariates and also excludes cases with missing values on predictors and covariates. Importantly, sensitivity analysis indicated our path model results were robust for women and men, although possibly conservative in male estimates of adverse effects of low childhood SEP on unsafe school, and unsafe school on academic problems. Additionally, findings may not generalize to more recent birth cohorts of Black Americans. Data were not available on neighborhood conditions such as alcohol availability and neighborhood poverty, although attendance at a high-poverty school might be a proxy for neighborhood poverty. Available data did not permit analysis of reciprocal effects between adolescent drinking and educational achievement reported in prior studies^{68–70} so this bears replication in future research. However, to estimate independent effects of educational attainment on young adult and midlife heavy drinking, we accounted for early onset of drinking which is associated with both escalation of drinking among Black adolescents⁴¹ and, potentially, educational attainment. Thus, path coefficients from educational attainment to heavy drinking represent effects independent of early drinking onset. Because available heavy drinking data captured 6+ drinks/day, which exceeds the US National Institute on Alcohol Abuse and Alcoholism's threshold of 5+/4+ drinks/day for men and women, respectively, observed associations with heavy drinking might be conservative. Finally, future research on heavy drinking pathways could investigate the roles of neighborhood conditions, cannabis and other drug use, and protective and resilience factors that support paths to higher educational attainment and lower-risk drinking.

Conclusion

Education across the life course matters in various ways for Black Americans' heavy drinking at midlife. Observed pathways to educational attainment highlight intergenerational effects of parents' own education which affects children's exposure to adolescent poverty. High school students' experiences of suspension and lower educational expectations also strongly influence educational attainment. The latter, in turn, affects risk for subsequent young adult heavy drinking and, for women, repeated unemployment and chronic poverty during the transition out of young adulthood. Our findings suggest several possible intervention targets for disrupting pathways to midlife heavy drinking among Black Americans. Multisector efforts to reduce early poverty, alongside school-based strategies to address implicit racial bias, replace exclusionary school discipline practices, and elevate educational expectations and academic performance, could help increase educational attainment of Black Americans. If successful, an array of social and health benefits could follow⁷¹, including population-level reductions in harmful drinking.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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References

1. Chetty R, Hendren N, Jones MR, Porter SR. Race and economic opportunity in the United States: an intergenerational perspective. *Q J Econ.* 2020;135(2):711–783.
2. Grant BF, Goldstein RB, Saha TD, et al. Epidemiology of DSM-5 Alcohol Use Disorder: results from the National Epidemiologic Survey on Alcohol and Related Conditions III. *JAMA Psychiatry.* 2015;72(8):757–766. [PubMed: 26039070]
3. Chartier KG, Vaeth PAC, Caetano R. Focus On: Ethnicity and the social and health harms from drinking. *Alcohol Res.* 2013;35(2):229–237. [PubMed: 24881331]
4. Shield KD, Gmel G, Kehoe-Chan T, Dawson DA, Grant BF, Rehm J. Mortality and potential years of life lost attributable to alcohol consumption by race and sex in the United States in 2005. *PLoS ONE.* 2013;8(1):e51923. [PubMed: 23300957]
5. Grant JD, Vergés A, Jackson KM, Trull TJ, Sher KJ, Bucholz KK. Age and ethnic differences in the onset, persistence and recurrence of alcohol use disorder. *Addiction.* 2012;107(4):756–765. [PubMed: 22085024]
6. Witbrodt J, Mulia N, Zemore SE, Kerr WC. Racial/ethnic disparities in alcohol-related problems: differences by gender and level of heavy drinking. *Alcohol Clin Exp Res.* 2014;38(6):1662–1670. [PubMed: 24730475]
7. Zapolski TCB, Pedersen SL, McCarthy DM, Smith GT. Less drinking, yet more problems: understanding African American drinking and related problems. *Psychol Bull.* 2014;140(1):188–223. [PubMed: 23477449]
8. Adler NE, Stewart J. Health disparities across the lifespan: meaning, methods, and mechanisms. *Ann N Y Acad Sci.* 2010;1186(1):5–23. [PubMed: 20201865]
9. Mulia N, Karriker-Jaffe KJ, Witbrodt J, Bond J, Williams E, Zemore SE. Racial/ethnic differences in 30-year trajectories of heavy drinking in a nationally representative U.S. sample. *Drug Alcohol Depend.* 2017;170:133–141. [PubMed: 27889594]
10. Karriker-Jaffe KJ, Witbrodt J, Mulia N. Differential consequences: racial/ethnic and gender differences in the enduring impact of early disadvantage on heavy drinking in midlife. *Prev Sci.* 2019;20(7):1009–1020. [PubMed: 31292812]
11. Grant BF. Prevalence and correlates of alcohol use and DSM-IV alcohol dependence in the United States: results of the National Longitudinal Alcohol Epidemiologic Survey. *J Stud Alcohol.* 1997;58(5):464–473. [PubMed: 9273910]
12. Droomers M, Schrijvers CTM, Stronks K, van de Mheen D, Mackenbach JP. Educational differences in excessive alcohol consumption: the role of psychosocial and material stressors. *Prev Med.* 1999;29(1):1–10. [PubMed: 10419792]
13. Casswell S, Pledger M, Hooper R. Socioeconomic status and drinking patterns in young adults. *Addiction.* 2003;98(5):601–610. [PubMed: 12751977]
14. Karlamangla A, Zhou K, Reuben D, Greendale G, Moore A. Longitudinal trajectories of heavy drinking in adults in the United States of America. *Addiction.* 2006;101(1):91–99. [PubMed: 16393195]
15. Cutler DM, Lleras-Muney A. Understanding differences in health behaviors by education. *J Health Econ.* 2010;29(1):1–28. [PubMed: 19963292]
16. Galobardes B, Shaw M, Lawlor DA, Lynch JW, Smith GD. Indicators of socioeconomic position (part 1). *J Epidemiol Community Health.* 2006;60(1):7–12.
17. Conti G, Heckman J, Urzua S. The education-health gradient. *Am Econ Rev.* 2010;100(2):234–238. [PubMed: 24741117]
18. Conti G, Hansman C. Personality and the education-health gradient: A note on “Understanding differences in health behaviors by education”. *J Health Econ.* 2013;32(2):480–485. [PubMed: 23245875]

19. Khine MS. Non-cognitive skills and factors in educational success and academic achievement. In: Khine MS, Aarepattamannil S, eds. *Non-cognitive Skills and Factors in Educational Attainment*. Vol 9. Rotterdam: Sense Publishers; 2016:3–9.
20. McIntyre JR, Vecchione R. Considering non-cognitive factors in the preparation and selection of educators. In: Khine MS, Aarepattamannil S, eds. *Non-cognitive skills and factors in educational attainment*. Rotterdam: Sense Publishers; 2016.
21. Shubert J, Wray-Lake L, McKay B. Looking ahead and working hard: How school experiences foster adolescents' future orientation and perseverance. *J Res Adolesc*. 2020;30(4):989–1007. [PubMed: 32910513]
22. Liu A. Can non-cognitive skills compensate for background disadvantage? -- the moderation of non-cognitive skills on family socioeconomic status and achievement during early childhood and early adolescence. *Soc Sci Res*. 2019;83:102306. [PubMed: 31422837]
23. Ross CE, Mirowsky J. The interaction of personal and parental education on health. *Soc Sci Med*. 2011;72(4):591–599. [PubMed: 21227556]
24. Mensah FK, Kiernan KE. Gender differences in educational attainment: influences of the family environment. *British Educational Research Journal*. 2010;36(02):239–226.
25. Mulia N, Tam T, Bond J, Zemore SE, Li L. Racial/ethnic differences in life-course heavy drinking from adolescence to midlife. *J Ethn Subst Abuse*. 2018;17(2):167–186. [PubMed: 28632096]
26. Kuh D, Ben-Shlomo Y, Lynch J, Hallqvist J, Power C. Life course epidemiology. *J Epidemiol Community Health*. 2003;57(10):778–783. [PubMed: 14573579]
27. United States Commission on Civil Rights. *Public Education Funding Inequity in an Era of Increasing Concentration of Poverty and resegregation*. Washington, DC: United States Commission on Civil Rights;2018.
28. Aud S, Hussar W, Planty M, et al. *The Condition of Education 2010 (NCES 2010–028)*. In: Vol 2021. Washington, DC: National Center for Education Statistics, Institute of Education Sciences, U.S.; 2010: <https://nces.ed.gov/pubs2010/2010028.pdf>.
29. Milam AJ, Furr-Holden CDM, Leaf PJ. Perceived school and neighborhood safety, neighborhood violence and academic achievement in urban school children. *Urban Rev*. 2010;42(5):458–467. [PubMed: 21197388]
30. Arcia E. Achievement and enrollment status of suspended students: outcomes in a large, multicultural school district. *Educ Urban Soc*. 2006;38(3):359–369.
31. Owens A. Neighborhoods and schools as competing and reinforcing contexts for educational attainment. *Sociol Educ*. 2010;83(4):287–311.
32. Chen P, Vazsonyi AT. Future orientation, school contexts, and problem behaviours: a multilevel study. *J Youth Adolesc*. 2013;42(1):67–81. [PubMed: 22760994]
33. Hintsanen M, Hintsala T, Merjonen P, Leino M, Keltikangas-Järvinen L. Family- and school-related factors in 9- to 15-year-olds predicting educational attainment in adulthood: a prospective 27-year follow-up study. *Electronic Journal of Research in Educational Psychology*. 2011;9(2):523–540.
34. Skiba RJ, Chung C-G, Trachok M, Baker TL, Sheya A, Hughes RL. Parsing disciplinary disproportionality: contributions of infraction, student, and school characteristics to out-of-school suspension and expulsion. *Am Educ Res J*. 2014;51(4):640–670.
35. Bertrand M, Pan J. The trouble with boys: social influences and the gender gap in disruptive behavior. *Am Econ J Appl Econ*. 2013;5(1):32–64.
36. Rothstein DS, Carr D, Cooksey E. Cohort profile: The National Longitudinal Survey of Youth 1979. *Int J Epidemiol*. 2019;48(1):22–22e. [PubMed: 29982488]
37. Bureau of Labor Statistics. *National Longitudinal Surveys: Custom weighting program documentation* [Accessed: 2016-04-20. Archived by WebCite@ at <http://www.webcitation.org/6guiInSY0>]. Washington, DC 2016.
38. Williams E, Mulia N, Karriker-Jaffe KJ, Lui CK. Changing racial/ethnic disparities in heavy drinking trajectories through young adulthood: a comparative cohort study. *Alcohol Clin Exp Res*. 2018;42(1):135–143. [PubMed: 29087584]
39. APHA's Center for School Health and Education. *Chronic Stress and the Risk of High School Dropout*. American Public Health Association; February 2018.

40. Hingson RW, Heeren T, Winter MR. Age of alcohol-dependence onset: associations with severity of dependence and seeking treatment. *Pediatrics*. 2006;118(3):e755–e763. [PubMed: 16950966]
41. Horton EG. Racial differences in the effects of age of onset on alcohol consumption and development of alcohol-related problems among males from mid-adolescence to young adulthood. *J Ethn Subst Abuse*. 2007;6(1):1–13.
42. Chartier KG, Thomas NS, Kendler KS. Interrelationship between family history of alcoholism and generational status in the prediction of alcohol dependence in US Hispanics. *Psychol Med*. 2017;47(1):137–147. [PubMed: 27681653]
43. Barbeau K, Boileau K, Sarr F, Smith K. Path analysis in Mplus; A tutorial using a conceptual model of psychological and behavioral antecedent of bulimic symptoms in young adults. *The Quantitative Methods for Psychology*. 2019;15(1):38–53.
44. Ullman JB, Bentler PM. Structural Equation Modeling. In: Weiner IB, ed. *Handbook of Psychology, Second Edition*. Vol 2. Wiley; 2012.
45. Mplus Version 7.2 [computer program]. Los Angeles, CA: Muthén & Muthén; 2013.
46. Steiger JH. Understanding the limitations of global fit assessment in structural equation modeling. *Pers Individ Dif*. 2007;42(5):893–898.
47. Cangur S, Ercan I. Comparison of model fit indices used in structural equation modeling under multivariate normality. *Journal of Modern Applied Statistical Methods*. 2015;14(1):152–167.
48. Weston R, Gore PA Jr. A brief guide to structural equation modeling. *Couns Psychol*. 2006;34(5):719–751.
49. Byrne BM. *Structural equation modeling with Mplus: Basic concepts, applications, and programming*. New York: Routledge; 2012.
50. Raykov T, Marcoulides GA. On multilevel model reliability estimation from the perspective of structural equation modeling. *Struct Equ Modeling*. 2006;13(1):130–141.
51. Bentler PM. Comparative fit indexes in structural models. *Psychol Bull*. 1990;107(2):238–246. [PubMed: 2320703]
52. MacKinnon DP. *Introduction to statistical mediation analysis*. New York: Laurence Erlbaum Associates; 2008.
53. Hu L-t Bentler PM. Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Struct Equ Modeling*. 1999;6(1):1–55.
54. Muthén LK, Muthén BO. *Mplus User's Guide, Version 8*. Los Angeles, CA: Muthén & Muthén; 2017.
55. Asparouhov T, Muthen B. Weighted Least Squares Estimation with Missing Data. 2010. <https://www.statmodel.com/download/GstrucMissingRevision.pdf>. Accessed 10-07-2020.
56. United States Government Accountability Office. K-12 Education: Discipline Disparities for Black Students, Boys, and Students with Disabilities [GAO-18-258]. 2018. <https://www.gao.gov/products/GAO-18-258>.
57. Ou S-R, Reynolds AJ. Predictors of educational attainment in the Chicago longitudinal study. *School Psychology Quarterly*. 2008;43(2):199–229.
58. Beal SJ, Crockett LJ. Adolescents' occupational and educational aspirations and expectations: links to high school activities and adult educational attainment. *Dev Psychol*. 2010;46(1):258–265. [PubMed: 20053022]
59. Boxer P, Goldstein SE, DeLorenzo T, Savoy S, Mercado I. Educational aspiration-expectation discrepancies: relation to socioeconomic and academic risk-related factors. *J Adolesc*. 2011;34(4):609–617. [PubMed: 21036390]
60. Chin MJ, Quinn DM, Dhaliwal TK. Bias in the air: a nationwide exploration of teachers' implicit racial attitudes, aggregate bias, and student outcomes. *Educ Res*. 2020;49(8):566–578.
61. Dee TS, Penner EK. The causal effects of cultural relevance: evidence from an ethnic studies curriculum. *Am Educ Res J*. 2017;54(1):127–166.
62. Dobbie W, Fryer RG Jr. Are high-quality schools enough to increase achievement among the poor? Evidence from the Harlem Children's Zone. *Am Econ J Appl Econ*. 2011;3(3):158–187.
63. Rosenbaum JE. Educational and criminal justice outcomes 12 years after school suspension. *Youth Soc*. 2020;52(4):515–547. [PubMed: 32528191]

64. Owens J, McLanahan SS. Unpacking the drivers of racial disparities in school suspension and expulsion. *Soc Forces*. 2020;98(4):1548–1577. [PubMed: 34017149]
65. Morgan H. Restorative justice and the school-to-prison pipeline: a review of existing literature. *Education Sciences*. 2021;11(4):159.
66. Driessen G, van Langen A. Gender differences in primary and secondary education: are girls really outperforming boys? *International Review of Education*. 2013;59:67–86.
67. Kogan SM, Bae D. Racial discrimination, protective parenting, and binge drinking among emerging adult Black men. *Alcohol Clin Exp Res*. 2020;44(11):2343–2349. [PubMed: 32945530]
68. Bradley BJ, Greene AC. Do health and education agencies in the United States share responsibility for academic achievement and health? A review of 25 years of evidence about the relationship of adolescents' academic achievement and health behaviors. *J Adolesc Health*. 2013;52(5):523–532. [PubMed: 23535065]
69. Patrick ME, Schulenberg JE, O'Malley PM. High school substance use as a predictor of college attendance, completion, and dropout: a national multicohort longitudinal study. *Youth Soc*. 2016;48(3):425–447. [PubMed: 27134316]
70. McLeod JD, Uemura R, Rohrman S. Adolescent mental health, behavior problems, and academic achievement. *J Health Soc Behav*. 2012;53(4):482–497. [PubMed: 23197485]
71. Freudenberg N, Ruglis J. Reframing school dropout as a public health issue. *Prev Chronic Dis*. 2007;4(4):A107. [PubMed: 17875251]

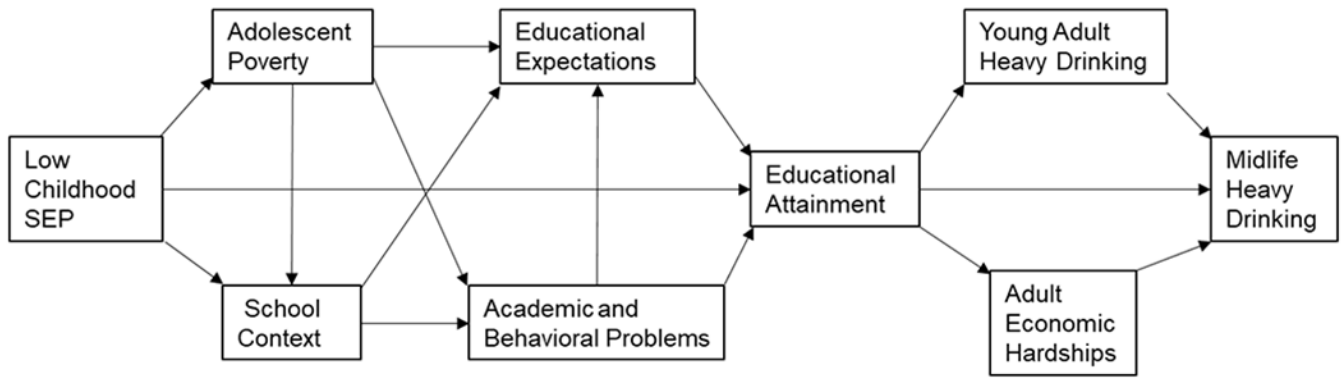


Fig. 1. Conceptual Model of Pathways from Low Childhood Socioeconomic Position to Midlife Heavy Drinking

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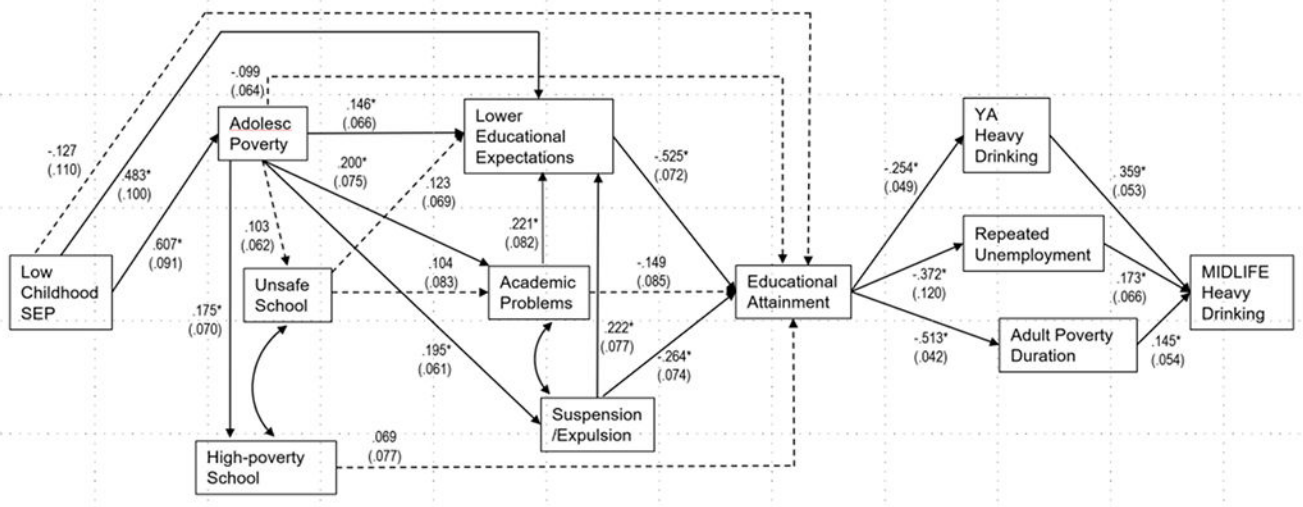


Fig. 2.
Standardized Estimates for Black American Women

Notes: All modeled standardized direct paths are displayed. Solid lines and * indicate $p < .05$. Observations = 583 (71 observations were excluded from the final path model due to missing values on either family history of alcohol problems or low childhood SEP), $df = 105$, CFI = 0.995, TLI = 0.992, RMSEA estimate = 0.008 ($p < .05$), R^2 midlife heavy drinking (0.223), total effect ($\beta = 0.131$, CI = 0.072-0.197).

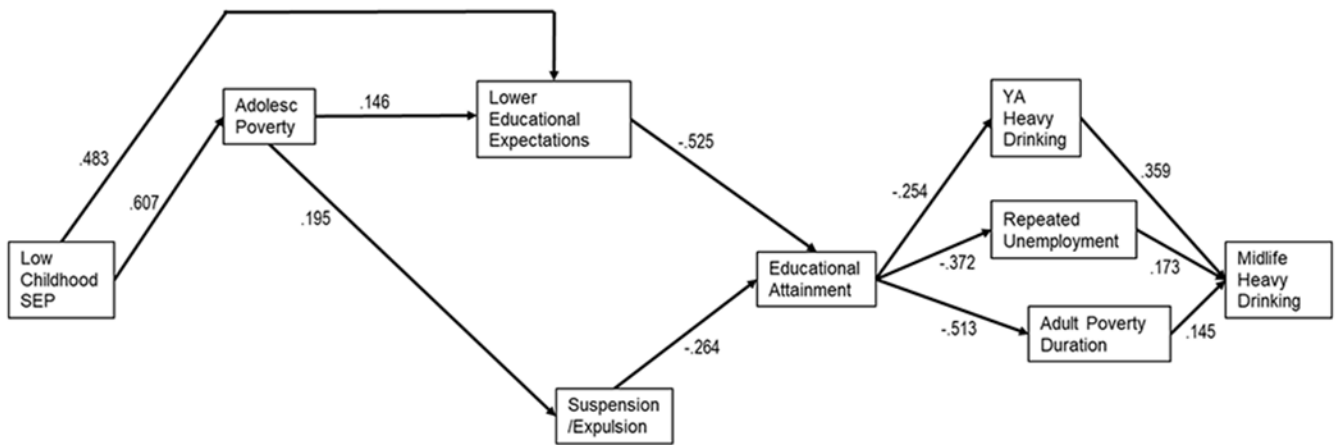


Fig. 3.
 Significant Indirect Paths for Black American Women
 Total indirect effect: $\beta=.131$, 95% CI=.072-.197. Standardized bias-corrected bootstrap coefficients and 95% confidence intervals for significant indirect pathways:

Low SEP -->	low expectn -->	educ attainmt -->	YA heavy drkg -->	Midlife heavy drinking ($\beta=.023$, CI=.010-.045)	
Low SEP -->	low expectn -->	educ attainmt -->	adult poverty -->	Midlife heavy drinking ($\beta=.019$, CI=.004-.043)	
Low SEP -->	low expectn -->	educ attainmt -->	unemplymt -->	Midlife heavy drinking ($\beta=.016$, CI=.002-.046)	
Low SEP -->	adol poverty -->	low expectn -->	educ attainmt -->	YA heavy drkg -->	Midlife heavy drinking ($\beta=.004$, CI=.001-.011)
Low SEP -->	adol poverty -->	suspension -->	educ attainmt -->	YA heavy drkg -->	Midlife heavy drinking ($\beta=.003$, CI=.001-.008)
Low SEP -->	adol poverty -->	suspension -->	educ attainmt -->	adult poverty -->	Midlife heavy drinking ($\beta=.002$, CI=.001-.007)

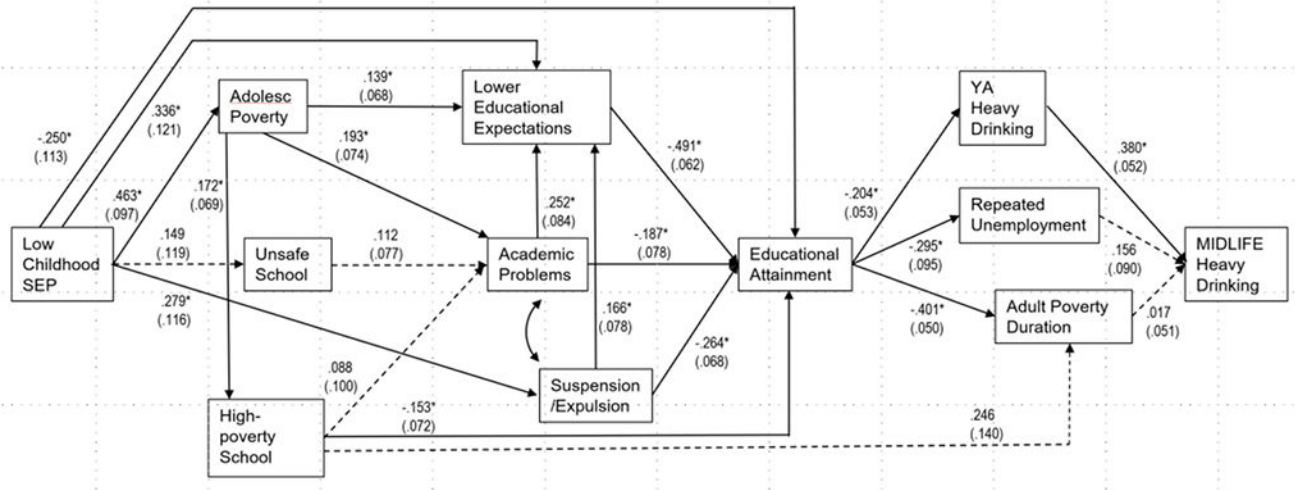


Fig. 4. Standardized Estimates for Black American Men

Notes: All modeled standardized direct paths are displayed. Solid lines and * indicate $p < .05$. Observations = 557 (88 observations were excluded from the final path model due to missing values on either family history of alcohol problems or low childhood SEP), $df = 111$, CFI = 0.983, TLI = 0.976, RMSEA estimate = 0.011 ($p < .05$), R^2 midlife heavy drinking (0.200), total effect ($\beta = 0.080$, $CI = 0.035-0.139$)

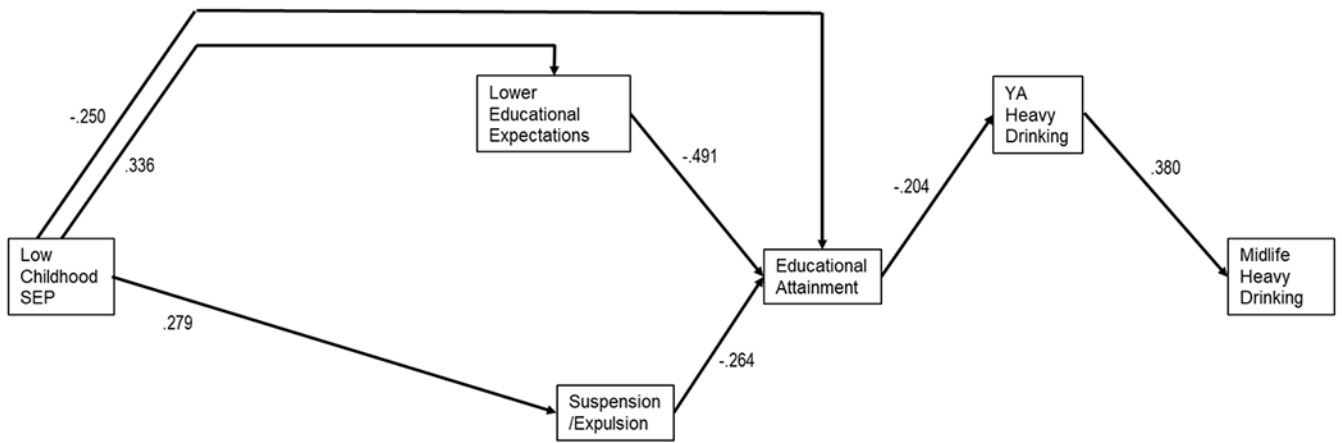


Fig. 5.
 Significant Indirect Paths for Black American Men
 Total indirect effect: $\beta=.077$, 95% CI=.038-.123. Standardized bias-corrected bootstrap coefficients and 95% confidence intervals for significant indirect pathways:

Low SEP -->	educ attainmt -->	YA heavy drinking -->	Midlife heavy drinking ($\beta=.014$, CI=.002-.034)	
Low SEP -->	low expectatn. -->	educ attainmt -->	YA heavy drinking -->	Midlife heavy drinking ($\beta=.016$, CI=.006-.031)
Low SEP -->	suspension -->	educ attainmt -->	YA heavy drinking -->	Midlife heavy drinking ($\beta=.006$, CI=.002-.014)

Table 1.

Variable proportions, means, and correlations by gender (females n=654 and males n=645)^f

	All	F	M	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
1	Low childhood SEP (%)	43.4	45.7	41.2	--	.37	.19	.06	.42	.26	.10	-.39	.06	.24	.22	.03	-.04	-.08	-.10	-.06	-.09
					.17																
2	Adol. poverty dur. (m)	40.1	0.41	0.39	.29	.16	.20	.09	.36	.21	.24	-.33	.09	.22	.23	.09	-.03	.09	.01	-.32	-.03
3	High-poverty sch. (%)	43.6	43.7	43.5	.04	.19	--	.14	.17	.02	.03	-.13	-.07	.04	.12	.01	.07	-.09	-.04	-.11	-.07
						.79															
4	Unsafe sch. score (m) [*]	1.62	1.71	1.54	.09	.02	-.08	.81	.16	.13	-.02	-.19	-.02	-.13	.08	.06	-.05	.27	-.02	-.08	-.02
5	Lower educ. expect. (%)	56.7	54.7	58.7	.33	.22	.05	.09	--	.38	.31	-.72	.07	.17	.36	.32	.01	.17	.01	-.20	-.07
6	Academic probs. (%)	34.7	30.9	38.4	.15	.22	.11	.15	.32	--	.24	-.43	.18	.22	.28	.06	-.06	.07	-.02	-.14	-.07
7	Suspend/expel (%) [*]	39.5	29.6	49.5	.19	.15	-.01	.13	.19	.12	--	-.39	.20	.34	.32	.13	.02	-.09	.07	-.30	-.16
8	Educ. attain. HS (%) ^{2*}	67.2	71.5	63.0	-.35	-.25	-.16	-.08	-.64	-.35	-.35	--	-.18	-.25	-.43	-.12	-.05	-.04	-.10	.22	.02
														1.87							
9	YA HD freq. (m) ^{3*}	1.09	0.57	1.63	.06	.03	.07	.05	.11	.07	.23	-.19	6.58	.15	.24	.28	.06	.14	.08	-.10	-.22
10	Repeated unempl. (%)	4.49	4.37	4.61	-.03	.10	.33	.13	.20	.16	.05	-.24	.01	--	.32	.14	-.07	-.04	-.08	-.00	-.34
11	Adult poverty dur. (m) [*]													.16							
12	Midlife HD freq. (m) ⁴	0.54	0.29	0.79	.09	.07	.14	.04	.06	.18	.11	-.13	.37	.12	.09	2.67	-.00	-.05	-.02	-.02	-.16
																.98					
13	Age at interview (m)	17.1	17.1	17.0	.03	-.05	-.08	-.09	-.01	-.13	.08	-.12	.04	-.02	.01	-.04	1.94	-.08	.09	-.18	-.02
14	Alc. onset age 14 (%) [*]	6.98	2.42	11.1	.04	.06	-.05	-.02	.07	-.12	.11	-.16	.08	-.30	.08	.11	.00	--	-.15	-.22	-.04

	All	F	M	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
15	Fam. alc. history (m) *	0.07	0.08	0.06	-0.00	-0.09	-0.11	-0.01	.10	-0.11	.13	.09	-0.06	-0.13	.01	-0.04	.02	.04	.01	-0.13	-0.13
16	Two-parent HH (%) *	54.4	51.1	57.6	-0.02	-0.29	.11	.06	-0.04	-0.02	-0.15	.06	.01	.02	-0.14	.03	-0.10	-0.21	-0.21	--	.16
17	Married at age 25 (%) *	28.4	32.5	24.2	-0.01	-0.14	-0.12	-0.01	-0.04	-0.00	.03	.13	-0.11	-0.41	-0.21	-0.12	-0.12	-0.13	.12	.24	--

.01

NOTES.

* p<.05 when comparing males with females; correlational coefficients for females shown above the diagonal and males below the diagonal. Variances are shown on the diagonal with female values displayed above male values. Low childhood SEP = parent did not graduate high school; m = mean value; adol.=adolescent; dur.=duration; sch.=school; educ.=educational; HS= high school graduate; expect.= expectations; probs.=problems; YA= young adult; HD = heavy drinking; unempl.=unemployment; freq.=frequency; alc.=alcohol; Fam. alc. history=Family alcohol history score; HH= household;

¹ Educational attainment HS = High school diploma by age 19 but no Bachelor's degree. Other categories not shown in table: Educational attainment < HS degree: total=22.3%, female=17.1%, male=27.6%; Bachelor's degree or higher by age 25: total=10.5%, female=11.5%, male=9.5%

² Inclusion criteria: Black American (n=2,805), ages 15-19 (n=1,951) and NLSY school survey data available (n=1,299), resulting in females n=654 and males n=645.

³ % who engaged in YA HD (not included in table): 37.8%

⁴ % who engaged in midlife HD (not included in table): 25.0%