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Educational attainment and the clustering of health-related behavior among U.S. young adults

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Abstract

We documented health-related behavior clustering among US young adults and assessed the extent to which educational attainment was associated with the identified clusters. Using data from Wave IV of the National Longitudinal Study of Adolescent to Adult Health (Add Health), we performed latent class analysis on 8 health-related behaviors (n = 14,338), documenting clustering of behavior separately by gender. Subsequently, we used multinomial logistic regression and estimated associations between educational attainment and the health-related behavior clusters. Twenty-eight percent of young women grouped into the most favorable health behavior cluster, while 22 percent grouped into a very high-risk cluster. A larger percentage of young men (40 percent) grouped into the highest risk cluster. Individuals with educational attainment at the college and advanced degree levels exhibited much lower risk of being in the unhealthy behavioral clusters than individuals with lower educational attainment, net of a range of confounders. Substantial fractions of US young adults, particularly those with less than college degrees, exhibit unhealthy behavior profiles. Efforts to improve health among young adults should focus particular attention on the clustering of poor health-related behavior, especially among individuals who have less than a college degree.

Keywords

health-related behavior; behavior clusters; educational attainment

Highly educated adults enjoy better health and lower mortality rates across every age, gender, and racial/ethnic subgroup of the US population. One important pathway relating education to health and mortality is health behavior [1, 2]. As such, a growing literature focuses on elucidating disparities in health behavior by educational attainment, with many studies showing that individuals with higher education exhibit more positive behavior [3, 4,

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5, 6]. This research, however, often treats behaviors individually, thereby obscuring broader patterns of behavior that emerge within individuals [1]. Increasingly, scholars have recognized the co-occurrence of behaviors within individuals in ways that vary across population subgroups [7, 8, 9, 10]. Thus, *clusters* of health-related behavior may also be strongly differentiated by educational attainment.

Identifying patterns of high-risk health-related behavior is a critical step toward improving US population health. Recently, a National Research Council and Institute of Medicine report [11] highlighted the overall worse health of US young adults compared with young adults in other high income countries; poorer health-related behavior was discussed as one important reason for inferior US health. Understanding health-related behavior clusters within individuals and among specific population subgroups would help target public health interventions that work to improve health-related behavior and population health.

Conceptually, educational attainment exposes individuals to resources that can be used to improve health-related behavior [12]. Through expanded health knowledge, increased income, better employment, enhanced social networks, and a greater sense of control over their lives, higher educational attainment is associated with improved health-related behavior [3, 13]. With increased education and greater access to these resources, individuals may be more likely to package health-related behaviors into clusters resembling a healthy lifestyle [14]. However, individual and family-level characteristics may influence both educational attainment and health-related behavior, thereby confounding the association between individuals' educational attainment and health-related behavior clustering. These potential confounders include family socioeconomic/social background, demographic factors, personality characteristics, and adolescent delinquency experiences [3, 15]. Such confounders should be accounted for to best understand the association between education and clusters of health-related behavior.

Based on this conceptual guide, we use data from the National Longitudinal Study of Adolescent to Adult Health (Add Health) to address the following questions: 1) do health-related behavior clusters emerge among US young adult women and men?; and 2) to what extent is educational attainment associated with the health-related behavior clusters? Given widening education-health disparities among recent birth cohorts [16, 17, 18], we focus on young adults because educational attainment likely differentiates the health and mortality outcomes of young adults more so than at any point in recent US history [15]. Further, we examine the association of educational attainment with clusters of health-related behavior while controlling for potential confounders. Overall, we expect to find that higher educational attainment is associated with more positive health-related behavior clustering among US young adults given the powerful resources that education confers upon individuals in the contemporary US [1, 12, 13].

Methods

Data and Sample

Add Health is a nationally representative survey that has followed adolescents into young adulthood through four waves [19]. Schools included in Add Health were selected by region,

urbanicity, school size, school type, and racial composition based on a stratified sampling design. In-school data collection was done in 1994 when respondents were in grades 7–12 and was used to generate a nationally representative subsample of 20,745 adolescents for Wave I in-home interviews in 1995. Additional in-home interviews were conducted in 1996 (Wave II), 2001–2002 (Wave III), and 2007–2008 (Wave IV).

Our analytic sample includes respondents who completed in-home interviews in Waves I (ages 12–18) and IV (ages 24–32), had valid sampling weights, and provided information on educational attainment and the health-related behaviors we assessed. Women who were pregnant or had given birth in the six months prior to Wave IV interview were excluded. These filters resulted in an analytic sample size of 14,338. In analyses, sampling weights accounted for study design and corrected for differential attrition. Multiple imputation techniques accounted for missingness.

Measures

Educational attainment—Educational attainment was operationalized as the respondent's highest attainment at the Wave IV interview, at which point the majority of respondents had completed their education. A set of mutually exclusive dummy variables was created to represent highest attainment: less than high school, high school graduate or equivalence, some college, college graduate, and post-baccalaureate degree earners. High school graduates are the reference group in regression analyses.

Health-related behavior—A series of 8 health-related behaviors from Wave IV, when respondents were aged 24–32, were included in our cluster analysis. Specifically, the behaviors were binge drinking (i.e., consuming 5 or more alcoholic beverages at one time in the last week), cigarette smoking in the past 30 days, use of other tobacco products such as chewing tobacco or snuff in the past 30 days, participating in physical activity in the past 7 days, using marijuana in the past 30 days, visiting the doctor and dentist for preventive care in the past year, and eating at fast food restaurants 3 or more times in the past 7 days. All behaviors were dichotomized such that a value of 1 represented the less healthy form (i.e., being a current cigarette smoker; not going to the doctor for a preventive visit; did not engage in physical activity), whereas a value of 0 represented more positive behavior (i.e., not a current cigarette smoker; went to the doctor during the past year; engaged in physical activity).

Confounders—Our analysis included demographic, family/adolescent background, personality, and young adult confounders of the education-behavior associations [3, 20, 21, 22, 23]. Confounding variables were measured using data from Waves I and IV. Age at Wave IV was measured continuously, ranging from 24–32. Race/ethnicity, reported at Wave I, was categorized as non-Hispanic white (referent), non-Hispanic black, non-Hispanic Asian, Hispanic, and other/multi-racial. Adolescent religiosity was measured on a scale ranging from 1 (religion is not at all important to you) to 4 (religion is very important to you). Adolescent delinquency was captured by a scale of nonviolent delinquent behaviors (i.e., stealing or vandalizing) ranging from 0 to 9 [24]. The Big Five personality characteristics (extraversion, neuroticism, agreeableness, conscientiousness, and openness)

were measured in Wave IV and each ranged from 4 to 20. Health insurance coverage was dichotomized as 1 if the respondent had coverage at Wave IV. We also controlled for family background characteristics, including: highest parental education from Wave I operationalized as an ordinal variable ranging from 1 (less than high school) to 5 (post-college degree); parent's income (in thousands) at Wave I operationalized continuously; and, family structure dichotomized as 1 if the young adult lived with both biological parents at Wave I. Young adult marital status was categorized as married (referent), cohabiting, or neither (i.e., single).

Analytic Strategy

We stratified analyses by gender because previous literature has identified differing patterns of health-related behavior by gender [25], and because the relationship between education and health is conditional on gender [26]. We determined clustering of health-related behaviors using latent class analysis (LCA), a type of structural equation modeling that classifies individuals into meaningful subpopulations based on a set of indicators. In this case, LCA grouped individuals according to their reported pattern of health-related behavior. Using Mplus [27], we determined the appropriate number of latent profiles that emerged among respondents through several criteria, including a log-likelihood test, Bayesian information criteria (BIC), and sample-size-adjusted BIC (ABIC). For these measures of fit, smaller absolute values indicate better model fit; thus, the relative change from the *k* class to *k-1* class is important in assessing fit. We further evaluated the Lo-Mendell Rubin (LMR) adjusted likelihood ratio test; a significant LMR *p*-value suggests that the *k* class model fits better than the *k-1* class model. Once LCA identified female- and male-specific clusters, the second step was to estimate the association between educational attainment and the health-related behavior clusters. Models were stratified by gender; the healthiest female and male profiles served as referents. Because we identified three clusters for both women and men, we used multinomial logistic regression in STATA to estimate these associations, controlling for confounders [28]. We report results using relative risk ratios, which are obtained by exponentiating the multinomial regression coefficients.

Results

LCA identified three profiles of health-related behavior for women and three for men. Appendix A provides the fit criteria used to make these determinations. Although the four-profile model was a better fit for both women and men according to the LMR *p*-value, the relative changes in log-likelihood, BIC, and ABIC values suggest that the three-profile model was the most adequate fit of the data for both genders. In addition to model fit, the three identified profiles for each gender presented substantively meaningful and useful clusters, including suitable numbers of respondents in each. Clusters were labeled based on the patterns of health-related behavior observed in each group.

Among women, 22% of respondents fell in the Unhealthy cluster. They have high proportions of cigarette smoking (71%), binge drinking (48%), and marijuana use (70%), along with moderately high levels of fast food eating (31%), no preventive care (46% for doctor, 52% for dentist), and no physical activity (15%). The second and largest cluster for

women was Mixed Healthy/Unhealthy (50%). Although containing negligible proportions of people who binge drink and use marijuana, this cluster included a moderate level of cigarette smoking (24%) and the highest female-specific proportions of fast food eating (43%) and no physical activity (27%). In contrast, the cluster labeled Most Healthy included women who reported negligible percentages of no physical activity or no dentist and doctor visits, and the lowest percentages of current cigarette smoking (15%), binge drinking (10%), marijuana use (6%), and fast food eating (2%). This cluster contained 28% of all females.

Among men, some similar patterns emerged, although the relative frequencies and composition of the groups varied from those of women. The largest group was the Unhealthy cluster, which comprised 40% of young adult men. They have high proportions of binge drinking (55%), marijuana use (62%), cigarette smoking (71%), fast food eating (44%), and other tobacco use (13%). The second largest group was labeled Mixed Healthy/Unhealthy and included 32% of young men; they have a moderate proportion of cigarette smoking (29%) and high proportions of fast food eating (51%), no physical activity (25%), and no preventive care (53% no doctor, 68% no dentist), but negligible proportions of binge drinking and marijuana use. The smallest health-related behavior cluster for young men was the More Healthy profile; they comprised just 27% of the male sample. They have relatively low proportions of current cigarette smoking (10%), binge drinking (15%), marijuana use (8%), and other tobacco use (9%). Few had not visited a doctor or dentist in the past year, and they contained the lowest male-specific proportion of fast food eating.

To understand compositional differences across clusters, Table 1 provides descriptive statistics. Educational attainment varied strongly by cluster such that, among women, the Most Healthy cluster had much higher frequencies of college and post-baccalaureate degree earners (25% and 22%) than the Mixed Healthy/Unhealthy (20% and 13%) or Unhealthy cluster (17% and 9%). Among men, the Unhealthy and Mixed Healthy/Unhealthy cluster had similarly low percentages of college and post-baccalaureate degree earners (15% and 5% for the Unhealthy cluster; 17% and 9% for the Mixed Healthy/Unhealthy), whereas men in the More Healthy (26% and 16%) cluster had higher percentages of college and post-baccalaureate educational attainment.

Table 2 shows results from multinomial logistic regression analyses predicting membership in health-related behavior clusters by educational attainment, controlling for individual and family-level confounders. Among women, risk of membership in the Unhealthy or Mixed Healthy/Unhealthy clusters is lowest among those with college degrees or higher. Compared with high school graduates, women with bachelor’s degrees and women who earned post-graduate degrees were significantly less likely to be members of the Unhealthy cluster than the Most Healthy cluster. Additionally, women with post-baccalaureate education had reduced risk of membership in the Mixed Healthy/Unhealthy cluster. Women with graduate degrees showed 59% lower risk of being in the Unhealthy cluster in comparison with high school educated women and 42% lower risk of being in the Mixed Healthy/Unhealthy cluster in comparison with high school educated women. Interestingly, women with less than a high school education and women with educational experience (but no earned degree) beyond high school did not differ from women with high school degrees with regard to health-related behavior clustering.

Among men, strong educational differences distinguished the Unhealthy and Mixed Healthy/Unhealthy clusters from the More Healthy cluster such that risk for membership in these less healthy profiles decreased as education increased beyond a high school degree. Compared with high school graduates, men with educational experience beyond high school, bachelor's degrees, and post-graduate degrees were significantly less likely to be members of the Unhealthy and Mixed Healthy/Unhealthy clusters. For example, men with post-baccalaureate education exhibit 79% lower risk of being in the Unhealthy cluster and 66% lower risk of being in the Mixed Healthy/Unhealthy cluster compared with men who have high school degrees.

A sensitivity analysis (data not shown) tested the consistency of our results with other methods [29] by regressing the probabilities of membership in each latent class on educational attainment and all covariates. Findings were consistent with our results, indicating that women with college or postgraduate degrees had lower probabilities of Unhealthy profile membership, but higher probabilities of Most Healthy profile membership. Men with higher levels of education had lower probabilities of Unhealthy profile membership, but higher probabilities of More Healthy profile membership. Probability of membership in the Mixed Healthy/Unhealthy cluster was not significantly associated with educational attainment for either gender. Therefore, differentiation of health-related behavior clustering by educational attainment was most apparent in distinguishing the healthiest profile from the least healthy profile for women and men.

Discussion

Individuals with higher education have better health in the US; and, more positive health behavior is one mechanism for this advantage. Increasingly, health behavior research focuses on how behaviors group together in order to understand pathologies, disparities, and overall health and well-being [7, 8, 9, 10]. Considering clusters of health-related behavior, therefore, we would expect differentiation by educational attainment. The current study aimed to illustrate gender-specific clustering of health-related behavior among US young adults and to determine whether educational attainment relates to the identified health-related behavior clusters.

We uncovered clear patterns of health-related behavior in our nationally representative sample of US young adults that were characterized by varying frequencies of positive and negative practices. Specifically, three profiles of health-related behavior emerged for both women (Unhealthy, Mixed Healthy/Unhealthy, Most Healthy) and men (Unhealthy, Mixed Healthy/Unhealthy, More Healthy). The composition of these clusters and their prevalence, however, varied strongly by gender, thus highlighting the importance of stratifying health-related behavior by gender. Further, strong educational differences in health-related behavior clusters emerged, robust to a wide range of confounders. More highly educated individuals, especially those with college degrees or higher, were less likely to be members of clusters most characterized by negative practices. This research therefore strongly supports health-related behaviors as a mechanism that may drive health disparities by educational attainment [5, 30].

Considering health-related behaviors as clusters rather than isolated practices demonstrates that individuals tend to exhibit a mix of positive and negative health behaviors. Among women, the Unhealthy profile showed high levels of negative health behavior, but nowhere near 100 percent of women in this group exhibited any of the negative behaviors. The Mixed Healthy/Unhealthy cluster showed even more variability. Similarly, among men, the Unhealthy cluster was characterized largely by negative health behaviors, but the Mixed Healthy/Unhealthy and More Healthy clusters were variable. Therefore, individuals are not necessarily engaging in strictly positive (or negative) health behaviors. Instead, they tend to engage in some positive and other negative health behavior.

An important exception to variability in behavior within profiles, however, was the Most Healthy cluster among women. This cluster is the most exemplary group: these women comprise the only cluster with consistently positive health behavior. The Most Healthy women, however, also have the highest educational composition and most favorable individual and family-level characteristics. This group therefore represents close to the ideal in terms of health-related behavior, but they are also the most socially advantaged. Moreover, they only comprised 28 percent of young women. An exemplary group did not emerge among men, highlighting that identical patterns in health-related behavior did not emerge across genders. In sum, women and men report differential engagement in health-related behavior, lending to variation in the composition of behavior clusters by gender.

Gender differences were also evident in the educational gradients of health-related behavior clusters, despite the strong association of education with behavior clustering for both genders. This gender variation is generally consistent with previous work that documents gender moderation of educational differences in health and mortality [31, 32, 33, 34, 35]. Among women, college and postgraduate education was associated with lower risk of membership in the less healthy behavior clusters. Among men, on the other hand, any educational attainment above high school was associated with lower risk of membership in the high-risk behavior clusters. This pattern of results for men suggests that those with high school degrees or less are especially prone to poor health-related behavior clustering.

Given that low-educated individuals appear to be at particularly high risk for poor future health in the cohort we examined, future analysis should consider how young adults in different educational attainment categories change their health behavior clustering with increasing age. Identifying high-risk groups and tracking their behaviors over time may be useful for informing population health initiatives, which is especially important in the US context because of the overall poorer health of young adults in the US compared to other high income countries [11]. Further, unhealthy behavior profiles could have increasing implications for health/mortality with age, as chronic diseases risk becomes prevalent. At the same time, our results indicate a potential aging out of some unhealthy behaviors. Although the longitudinal nature of the Add Health dataset provides an opportunity to examine patterns of behaviors over time, we restricted our analyses to young adult behaviors. In doing so, we capture individuals at a time when they have likely completed their education and established patterns of behavior beyond family-of-origin influences. To target intervention, however, research should ultimately better understand how behavior patterns emerge and unravel across the life course; our analyses represent a first step.

In addition to age variation, race/ethnicity may condition the association between educational attainment and health behaviors, given extensive research on health/mortality differentials by race/ethnicity [36, 37, 38]. In support of race/ethnic variation, two notable patterns emerged in our findings. First, non-Hispanic black men had significantly lower risk than non-Hispanic white men of membership in the Unhealthy cluster. This finding is consistent with previous research that has shown, for example, high rates of binge drinking among young, white, college-going men [39, 40]. These unhealthy behaviors may therefore carry into young adulthood. Second, non-Hispanic black women had significantly greater risk of Mixed Healthy/Unhealthy profile membership than non-Hispanic white women. To systematically elucidate variation in the association between educational attainment and behavior clusters by race/ethnicity, we estimated race by education multiplicative interaction effects. Although these effects suggested modest variation, no clear patterns emerged. Future research, therefore, should consider how clustering of health behavior might emerge differently by race/ethnicity.

Furthermore, our analyses controlled for potential individual- and family-level confounders of the association between education and health-related behavior, and our results suggest the importance of several of these characteristics for clustering of health-related behavior. For both genders, adolescent delinquency, for example, was significantly associated with increased risk for membership in the Unhealthy cluster, while conscientiousness was significantly associated with decreased risk for membership in that cluster. Young adult marital status, further, mattered for health behavior clustering, with single and cohabiting individuals experiencing increased risk for membership in the Unhealthy cluster as compared to married individuals. Perhaps, the Unhealthy cluster represents young adults that have not transitioned into adult roles and statuses that benefit health-related behaviors [41, 42]. Indeed, the association between marital status, insurance coverage, and personality with health-risk behavior clustering point to socialization processes that may have consequences for clustering of health-related behaviors. Future analyses should expand these findings, particularly by considering mediation of the association between educational attainment and health-related behavior clusters by characteristics such as marital status.

An important limitation of this work is that the behaviors included in the analysis, and their measurement schemes, potentially influence the identified clusters. In this analysis, the behaviors used to generate the latent classes of health-related behavior profile were measured on different time scales (e.g., weekly, monthly, yearly). Future studies should standardize the time-frame in which health behaviors are assessed to better gauge patterns.

Conclusion

This paper shows clear clustering of health-related behavior among US young adults. Moreover, our results show strong educational differences in health-related behavior clustering; these educational differences vary to some degree by gender. Looking forward, we encourage further study of how and why health-related behavior clusters develop by educational attainment and other measures of socioeconomic status and how such clusters, and their associations with socioeconomic status, change across the life course.

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Appendix A. Criteria to determine appropriate number of health behavior profiles using Latent Class Analysis for women and men

	1 class	2 class	3 class	4 class
PANEL A: WOMEN				
Loglikelihood	−28575	−27961	−27855	−27801
Parameters	8	17	26	35
BIC	57221	56073	55942	55914
ABIC	57196	56019	55859	55803
LMR p-value		0.0000	0.1127	0.0363
Distribution		75%, 25%	24%, 49%, 27%	12%, 27%, 19%, 42%
PANEL B: MEN				
Loglikelihood	−32106	−31459	−31353	−31309
Parameters	8	17	26	35
BIC	64283	63068	62936	62927
ABIC	64258	63014	62853	62816
LMR p-value		0.0000	0.0529	0.6477
Distribution		60%, 40%	32%, 42%, 26%	21%, 33%, 37%, 9%

Highlights

- Health-related behaviors cluster within US young adults.
- Small percentages of women and (especially) men exhibit healthy behavior clustering.
- Education is strongly associated with clustering of health-related behavior for both genders.
- High-risk health behavior clustering is especially pronounced among young men.

Table 1

Descriptive statistics by latent profile.

	Women			Men		
	Unhealthy (*n* = 1,653)	**Mixed Healthy/ Unhealthy (*n* = 3,694)**	**Most Healthy (*n* = 2,057)**	**Unhealthy (*n* = 2,802)**	**Mixed Healthy/ Unhealthy (*n* = 2,250)**	**More Healthy (*n* = 1,882)**
	Mean (SD)/ %	**Mean (SD)/ %**	**Mean (SD)/ %**	**Mean (SD)/ %**	**Mean (SD)/ %**	**Mean (SD)/ %**
Health-related behavior						
Binge drinker	47.67	0.60	10.38	55.46	0.00	15.11
Cigarette smoker	71.38	23.70	15.40	70.52	29.08	9.72
Other tobacco user	0.54	0.00	0.00	13.32	5.33	8.61
No physical activity	14.53	27.49	0.00	12.21	25.20	0.32
Marijuana user	70.44	0.00	5.98	62.05	0.00	8.46
No doctor visit	46.19	35.34	1.75	65.01	53.29	25.77
No dentist visit	51.97	53.15	1.75	65.31	68.13	0.00
Fast food eater	30.91	43.10	1.85	44.18	50.53	21.63
Educational attainment						
Less than high school	8.83	6.93	3.21	12.03	9.60	5.37
High school graduate	15.55	15.16	9.63	22.03	22.36	11.00
Post high school/some college	49.06	45.43	39.79	45.47	42.67	41.68
College graduate	17.42	19.50	25.05	15.14	16.62	25.78
Post-baccalaureate	9.13	12.97	22.32	5.32	8.76	16.16
Confounders						
Age (Wave IV)	28.11 (1.73)	28.49 (1.76)	28.54 (1.77)	28.48 (1.78)	28.72 (1.78)	28.75 (1.73)
Race/ethnicity						
Non-Hispanic White	58.74	46.48	56.39	58.60	47.69	54.09
Non-Hispanic Black	17.48	25.85	17.36	17.27	21.73	17.27
Hispanic	12.28	18.06	14.49	13.88	18.44	16.84
Non-Hispanic Asian	3.51	5.31	6.22	4.68	6.98	7.70
Other/multi-racial	7.99	4.30	5.54	5.57	5.16	4.09
Adolescent religiosity	2.89 (1.10)	3.21 (1.00)	3.16 (0.99)	2.89 (1.08)	3.07 (1.06)	3.09 (1.02)
Adolescent delinquency	1.40 (1.77)	0.75 (1.34)	0.69 (1.27)	1.65 (1.97)	1.05 (1.65)	1.03 (1.61)

	Women			Men		
	Unhealthy (*n* = 1,653)	**Mixed Healthy/ Unhealthy (*n* = 3,694)**	**Most Healthy (*n* = 2,057)**	**Unhealthy (*n* = 2,802)**	**Mixed Healthy/ Unhealthy (*n* = 2,250)**	**More Healthy (*n* = 1,882)**
	Mean (SD)/ %	**Mean (SD)/ %**	**Mean (SD)/ %**	**Mean (SD)/ %**	**Mean (SD)/ %**	**Mean (SD)/ %**
Young adult personality						
Extraversion	14.04 (3.05)	12.92 (3.11)	13.52 (2.91)	13.38 (3.08)	12.67 (3.09)	13.14 (2.95)
Neuroticism	11.45 (2.84)	11.00 (2.76)	10.48 (2.64)	10.11 (2.65)	9.87 (2.63)	9.50 (2.52)
Agreeableness	15.89 (2.29)	15.66 (2.24)	16.09 (2.02)	14.50 (2.52)	14.53 (2.49)	14.73 (2.40)
Conscientiousness	14.41 (2.90)	14.75 (2.72)	15.40 (2.62)	14.21 (2.62)	14.22 (2.64)	14.85 (2.55)
Openness	14.59 (2.43)	14.00 (2.41)	14.41 (2.32)	14.94 (2.47)	14.59 (2.51)	14.83 (2.50)
Has health insurance at WIV	70.76	80.96	91.98	64.48	74.89	90.83
Parent income (thousands, WI)	48.66 (58.29)	42.77 (47.27)	52.74 (67.06)	45.97 (43.20)	42.07 (40.29)	52.13 (56.08)
Parent's education						
Less than high school	11.82	16.04	11.26	10.14	13.64	10.32
High school graduate	30.30	30.26	26.32	30.87	32.12	25.88
Some higher education	24.27	22.28	20.33	22.12	19.39	20.97
College graduate	21.66	20.64	25.91	24.48	23.46	27.32
Post-college degree-earner	11.94	10.78	16.18	12.39	11.39	15.51
Live with two-bio parents (WI)	44.28	50.65	56.98	49.93	53.60	60.95
Young adult marital status						
Married	40.27	53.43	58.76	35.77	49.82	56.07
Cohabiting	47.36	29.35	26.45	46.13	28.79	26.91
Single	12.37	17.21	14.79	18.10	21.39	16.99

Note: *n* = 14,338; data source: National Longitudinal Study of Adolescent to Adult Health.

Table 2

Multinomial logistic regression predicting profile membership by educational attainment.

	RRR (SE)			
	Women		**Men**	
	Unhealthy	**Mixed Healthy/Unhealthy**	**Unhealthy**	**Mixed Healthy/Unhealthy**
Educational attainment (ref: HS graduate)				
Less than HS	1.248 (0.344)	1.453 (0.360)	0.896 (0.186)	0.890 (0.192)
Post HS	0.776 (0.134)	0.962 (0.137)	0.588 (0.081) ***	0.551 (0.078) ***
Bachelor's	0.581 (0.119) **	0.805 (0.130)	0.342 (0.057) ***	0.430 (0.072) ***
Post-baccalaureate	0.406 (0.092) ***	0.582 (0.100) **	0.210 (0.042) ***	0.341 (0.066) ***
Confounders				
Age	0.898 (0.026) ***	0.989 (0.024)	0.945 (0.025) *	0.991 (0.027)
Race/ethnicity (ref: Non-Hispanic White)				
Hispanic	0.547 (0.098) **	1.172 (0.175)	0.761 (0.109) †	1.033 (0.146)
Non-Hispanic Black	0.810 (0.121)	1.629 (0.189) ***	0.619 (0.083) ***	1.178 (0.155)
Non-Hispanic Asian	0.572 (0.166)†	1.253 (0.256)	0.639 (0.132) *	0.900 (0.194)
Other/multi-racial	1.043 (0.218)	0.694 (0.128) *	1.003 (0.228)	1.369 (0.307)
Adolescent religiosity	0.836 (0.043) ***	0.967 (0.040)	0.918 (0.042) †	0.998 (0.047)
Adolescent delinquency	1.288 (0.045) ***	1.021 (0.034)	1.179 (0.032) ***	1.008 (0.030)
Young adult personality				
Extraversion	1.052 (0.019) **	0.958 (0.014) **	1.028 (0.016) †	0.959 (0.015) **
Neuroticism	1.102 (0.019) ***	1.037 (0.016) *	1.047 (0.018) **	1.007 (0.019)
Agreeableness	0.989 (0.027)	0.995 (0.022)	1.039 (0.021) †	1.062 (0.023) **
Conscientiousness	0.925 (0.017) ***	0.943 (0.014) ***	0.906 (0.016) ***	0.889 (0.017) ***
Openness	1.064 (0.024) **	0.978 (0.019)	1.047 (0.021) *	1.019 (0.021)
Has health insurance WIV	0.307 (0.046) ***	0.388 (0.053) ***	0.256 (0.034) ***	0.365 (0.051) ***
Family income WI	1.001 (0.001)	0.999 (0.001)	1.000 (0.001)	0.998 (0.001)
Parent's education	0.984 (0.048)	0.947 (0.039)	1.071 (0.046)	0.919 (0.041) †
Two-bio family WI	0.754 (0.079) **	1.031 (0.090)	0.902 (0.086)	0.949 (0.093)
Marital status WIV (ref: married)				
Cohabiting	1.978 (0.231) ***	0.924 (0.093)	2.094 (0.218) ***	1.058 (0.117)
Single	1.779 (0.322) **	1.421 (0.209) *	1.668 (0.223) ***	1.059 (0.117)

Note: models run separately by gender; n = 7,404 women; n = 6,934 men;

† $p < .10$,

* $p < .05$,

** $p < .01$,

*** $p < .001$;

High School graduate was reference for degree; Most Healthy and More Healthy were reference groups for behavioral profile for women and men, respectively; data source: National Longitudinal Study of Adolescent to Adult Health.