Unhealthy parents and delayed matriculation from college: an important twist on the education-health association

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Keywords: Education and health.

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Abstract

In this paper we explore the links between parental health and the subsequent educational attainment of their children when they are adults. We use four waves of data from the National Longitudinal Study of Adolescent Health (n=13,556) to examine the influence of parental health when respondents were adolescents (1995) on the likelihood that the respondents will have graduated from college by their late 20s (2008). We also examine four mechanisms that may explain this association. College matriculation rates were 11.6% and 41.4% for those whose parents listed their as "Poor" or "Excellent" respectively (baseline OR = 1.53). Statistical controls for socioeconomic factors shared by parents and children accounted for the bulk of this association but we continue to see a residual effect of parental health on the educational attainment of their children despite adjusting for the health status of the respondent, parental education and income, community socioeconomic status, health behaviors of parents and respondents, as well as parental time investment. These findings provide a unique perspective on discussions involving causation and selection models of health and socioeconomic status. The intergenerational transmission of both education and health highlights the complexity and demonstrates the significance of this association.

Keywords: Education and health

Introduction

The relationship between socioeconomic status (SES) and health is a central focus of epidemiology, public health, sociology, psychology, and demography. This large and diverse body of work has yielded consistent evidence that various aspects of SES including education, income, wealth, occupation, and employment status are all strongly associated with physical health and mortality (Rogers, Hummer, and Nam 2000; Montez and Hayward 2011). Nevertheless, debates continue to center around the most appropriate operationalization of SES (Braveman et al. 2010), the functional form of the SES-health association (Adler et al. 1999), the level at which these associations are structured (Diez-Roux 2001), and the causal nature of this observed association (Smith 1999). To date, however, the bulk of this research has examined the SES-health association within a single generation; the health of an individual (whether cross sectional or longitudinal) is assessed as a function lifetime socioeconomic position or economic attainment in adulthood is modeled as a function of childhood health conditions (Link and Phelan 1995; Hayward and Gorman 2004; Case et al. 2005). Very little work has examined the link between SES and health across generations within families (Andrew and Ruel 2010) and virtually no work has assessed the extent to which having an ill parent may compromise one's educational attainment in young adulthood. This paper is unique in its attempt to provide some evidence regarding these complex associations and we examine social and behavioral factors that may account for this association. We see four possible reasons that parental health may influence the educational attainment of their children.

Parental Health → Offspring Health → Offspring Educational Attainment

Relatively healthy parents tend to have relatively healthy kids. Researchers have demonstrated fairly robust familial correlations for self-rated health of which roughly one-third is believed to be due to

common genetic factors (Johnson and Krueger 2005; Romeis 2000). Because of this strong familial association, having a healthy parent may simply be a proxy for the health status of the child. In which case having a healthy parent may not influence one's educational outcomes directly, but rather indirectly through their own health which may increase their likelihood of completing college. For example, Case et al. (2005) show that members of the 1958 British birth cohort who experienced poor health as children, were significantly more likely to work less, have lower occupational status, and passed less important qualifying exams; these associations remained despite controlling for family background SES. Currie and Stabile (2003) demonstrate that presence of frequent health-shocks interfered with the attainment of on-time academic goals and significantly reduced math and reading scores. Smith (1999) finds that individuals who struggle with health problems throughout their lives are less likely to acquire the requisite human capital necessary to acquire jobs with high income or social status. If this is the case then adjusting models for offspring health status should eliminate or substantially reduce the baseline association between parental health and the educational outcomes of their children.

Parental Health → Parental SES/Resources → Offspring Educational Attainment

Parental health may also affect the level of socioeconomic resources available to parents which may influence the subsequent educational attainment of their children. Smith (2004) shows that a health shock such as a sudden disability or major illness affects earnings capacity of adults and French (2005) shows that adults with chronically poor health spend a greater share of their disposable income on health care. Both mechanisms may compromise the resources available to parents to support their children's attendance at college. Indeed, Haas (2006) has shown that a substantial portion of the association between parental educational attainment and offspring educational attainment operates through offspring health. Parents with relatively poor health may

also be more likely to reside in socioeconomically disadvantaged neighborhoods (Robert 1998) which may further complicate the educational attainment of their children. Previous research has shown that neighborhood context is linked to school performance, high school completion, and college enrollment (Crane 1991) and there is a fairly large body of work describing the linkages between neighborhoods and health (Kawachi and Berkman 2002). Accordingly, adjustments for family income and neighborhood socioeconomic status may mediate some of the association between parental health and the educational attainment of their children. It is also possible that parental health is linked to the educational attainment of their children simply because of the strong association between health and education (Mirowsky and Ross 2003) within a generation as well as the limits on intergenerational social and educational mobility in the United States (Beller and Hout 2006). That is, poor parental health may simply be a proxy for low educational levels. If this is the case, then statistical controls for parental education should eliminate or substantially reduce the association between parental health and offspring education.

Parental Behaviors → Offspring Behaviors → Offspring Education

If parents have poor nutritional habits, lead a sedentary lifestyle, and/or smoke regularly then these factors will influence their health and their children may model these behaviors because of informal socialization. Pampel et al. (2010) review the literature on education and health behaviors and show that those with less than 12 years of education are nearly 3 times more likely than those with a college education to smoke, 3 times more likely to be inactive, and .5*.5 times more likely to be obese. Mirowsky and Ross (2003) contend that different dimensions of education (e.g. problem solving skills, self-efficacy) coalesce to bring about a kind of "learned effectiveness" that promotes healthy lifestyle choices. This is supported by recent research by Stringhini et al. (2010) who show that the association between SES (measured as occupational status) and mortality is largely due to health behavior differences across the groups (see Jha et al. 2006 for similar results).

This perspective is in line with the fundamental cause theory (Link and Phelan 1995) which emphasizes the increased rate at which more affluent persons adopt relatively healthy lifestyles in light of newer evidence that suggests adverse effects of certain behaviors. Accordingly, parental health status may reflect social background (point 2) in which children and their parents share a common understanding of and health promotive behaviors as well as resources that allow for individuals to make healthy choices. If the mechanism linking parental health to offspring education is the modeling of healthy lifestyles, then controls for parental and offspring health behaviors should attenuate or eliminate the association.

Parental Health → Parental Time Investment → Offspring Educational Attainment

Finally, health complications may influence the capacity of parents to be involved with their children on a regular basis. Research suggests that children who had parents that were involved with their school and social lives tend to have better educational and economic outcomes as adults (Auerbach 1989; Hill and Taylor 2004). Unhealthy parents may be less able or have less time to dedicate to shared activities with their children such as helping with homework, discussing school issues, or even going shopping (Stein et al. 2007). As such, children will have less time to dedicate to school-related activities such as homework compared to their peers with relatively healthy parents. If this process is cumulative in nature, then relatively small influences may become large enough to compromise the probability that a child will attain educational skills that lead to timely graduation, success in school, and ultimately transitions to post-secondary education. As skilled labor is critical to securing stable and rewarding employment, what may seem like a nascent parental health condition may have lasting influences on the economic well-being of their children. Therefore, statistical controls for the time that parents spend with their adolescent children should substantially reduce the association between parental health and offspring education.

METHODS

Data

All data in these analyses are drawn from the National Longitudinal Study of Adolescent Health (Add Health), a study that examines health and health-related behaviors among a nationally representative sample of adolescents who were initially in the seventh through twelfth grades (Harris 2003). In 1994, roughly 90,000 adolescents from 134 schools completed questionnaires about their daily activities, health-related behaviors, and basic social and demographic characteristics. A subset of respondents and their parents were then followed up with for in-home interviews (Waves 1-4) with more detailed questions across a number of important domains. Wave 4 was conducted in 2008 and early 2009 when the sampled individuals were in early adulthood. The data for this analysis is limited to those adolescents whose parents responded to the parental questionnaire and provided valid responses to questions related to socioeconomic status and health. Of the 15,702 young adult respondents remaining in Wave 4, 2,141 either did not have a parent questionnaire completed in Wave 1 or did not have valid data for parent self-rated health. In total, our analysis uses 13,556 respondents.

Measures

Table 1 presents means and confidence intervals for all variables used in the analyses. A description of each variable is provided below.

[Table 1 about here]

Educational attainment. This variable was measured in Wave 4 and captures the highest level of education to date for the young adult. Respondents who had completed a college education or higher by the Wave 4 interview (29.9%) were coded as 1 and all other respondents received scores of 0.

Self-rated health. Parents (Wave 1) and respondents (all waves) were asked "In general, how is your health?" Responses included "Excellent", "Very good", "Good", "Fair" or "Poor" and values ranged from 5 to 1. While self-rated health tends to capture more of a world view than simply health-related symptoms, self-rated health is an adequate and often used concept to represent health (see Idler [2006] and Boardman [2004]). Parental health is the primary independent variable in this study. Respondent health includes the value from Wave 1 and a change score from Wave 1 to Wave 3 so that we can longitudinally assess respondents' health status.

Socioeconomic status. We use three measures of socioeconomic status. First, *parental education* is assessed with a measure that describes the number of years of education completed by the parent interviewed in the Wave 1 in-home study. Second, *household income* is measured by response to the question "About how much total income, before taxes did your family receive in 1994?" Responses were recorded in dollars and the logged value was used as a control in the multivariate analyses. Finally, *neighborhood socioeconomic status* is a standardized composite scale of three census tract variables: proportion of tract age 25+ without high school diploma or equivalent; proportion of tract age 15+ with at least a college degree; and median household income (α=.81).

Health behaviors. In Wave 1, parents who answered yes to the question, "Do you a smoke?" were labeled "smokers". If the biological mother or father was identified as "obese" by the parental respondent and lived in the household then the adolescent is considered to have had an obese parent. For the adolescents, BMI in Wave 3 is calculated from measured height and weight and if BMI was 30 or greater, the individual is identified as obese. Finally, smoking status of the respondent in Wave 3 is coded 1 if they reported smoking every day for the previous 30 days and 0 if otherwise.

Shared activities. In Wave 1, respondents were asked whether their resident parental figure participated in various activities with them in the previous four weeks. The possibilities included

shopping, playing a sport, attending a religious service, talking about dating or parties, attending events, talking about serious problems, talking about grades, working on a project for school, talking about other school issues. We define parental involvement as the sum of the number of items answered in the affirmative by the respondent (alpha = .95).

Control variables. Several variables were drawn from Wave 4 and used as control variables in different areas of the analysis. These control variables include age, race (Non-Hispanic White, Non-Hispanic Black, Hispanic, and other), and sex.

Analyses

Our primary aim is to test the relationship between parental self-rated health and their offspring's educational attainment. Our secondary aim is to identify mechanisms that may explain this relationship. We use a series of nested logistic regression modes in order to gauge the influence of parent's health on the likelihood of their children achieving a college degree by their late 20s. After establishing a main effect, we successively add blocks of variables that represent the intervening factors that are hypothesized to mediate the main effects. These models are presented in Table 3. All data are weighted to reflect the complex sampling design of the Add Health study (Chantala and Tabor, 1999).

RESULTS

[Table 2 about here]

[Figure 1 about here]

Table 2 presents the proportion of respondents who have completed a college education by Wave 4 of the study. Keeping in mind that the median age for this sample is 29 years and the youngest age is 24, this measure captures the majority of college matriculation cases in the study. In total, 29.9% of the respondents had received a college degree or higher by this time in their lives. We also show a strong and monotonic association between parental health status and the probability of

completing college (see Figure 1). Specifically, while 41.4% of those whose parents were in excellent health in Wave 1 graduate college by Wave 4, only 11.6% of those whose parents were in poor health in Wave 1 had finished college by their late 20s. Importantly, it appears as though this association is consistent across levels of parental health rather than either extreme. These associations are statistically significant as evidenced by the confidence intervals as well as the model fit statistics (Chi-square(df=4) = 484.37, p<.001, design based F(3.95, 53551.31) = 64.87, p< .001).

[Table 3 about here]

Table 3 presents eight nested logistic regression models predicting college graduation by Wave 4 in which independent variables are sequentially included in order to examine changes in the coefficient for parental health. The baseline estimate (b=.423; p<.01) is comparable to the unadjusted bivariate associations shown in Table 2 and Figure 1. This estimate produces an odds-ratio of 1.53 suggesting that a one unit increase in parental health increases the relative odds of completing college by approximately fifty percent. This unadjusted estimate (and corresponding confidence interval) is also shown graphically in Figure 2 (M1). This figure summarizes the odds ratio for the effect of parental health on their children's likelihood of graduating college for each of the 8 models presented in Table 3. Model 2 enters controls for sociodemographic background and these adjustments slightly attenuate the bivariate association. Model 3 controls for the offspring's health (Wave 1) and change in their health from Wave 1 to Wave 3. Both health controls are positively linked to college graduation (healthier respondents are significantly more likely to graduate from college by Wave 4) but neither baseline nor change in health accounts for the link between parental health and college graduation. In total, roughly 17% of the main association is due to this important sociodemographic and health associations.

Models 4 – 6 enter controls for the three different measures of parental socioeconomic status. The most important is the total years of schooling of the parent (Model 4). This variable is

strongly linked with the parent's health status and their children's educational outcomes (b = .366, p<.01). The inclusion of this control variable explains roughly forty percent of the residual association between parental health and offspring education once offspring health and sociodemographic characteristics are included. In other words, much of this association appears to be due to intergenerational processes of educational mobility. However, despite this control, there remains a fairly substantial influence of parental health on the probability that their children will graduate from college. The beta coefficient (b= .198, p< .01) corresponds to an odds ratio of 1.22 and suggests that a one unit increase in health increases the relative odds of graduating from college by roughly 22%. Neighborhood SES is also strongly linked to the likelihood of completing school (b=.599, p<.01) and further reduces the association between parental health and offspring college graduation (b = .155, p< .01) and the same is true for parental income at Wave 1 (b = .216, p<.01). With all three fairly comprehensive SES controls, the odds-ratio for parental health drops to 1.15 but remains a significant predictor of college matriculation (see M6 in Figure 2).

Model 7 enters statistical controls for the health behaviors of parents and their offspring. Offspring smoking status (b = -.870, p<.01) and obesity (b = -.253, p<.01) at Wave 3 are more strongly linked to their college matriculation status at Wave 4 than their parents health behaviors, however, parental smoking and obesity are both predictive of the attainment of a college degree. These four controls further attenuate the link between parental health and the likelihood of their children receiving a college degree but the effect remains positive and statistically significant (b = .119, p<.01). Model 8 enters a control for the time that parents typically spent with the respondent during their adolescence (Wave 1). This variable is positively associated with college graduation (b = .095, p<.01) yet it does not appear to attenuate the residual effect of parental health which remains statistically significant (b=.116) with an odds-ratio of 1.12.

To gauge the influence of these confounding and mediating factors on the baseline association between parental health and college matriculation, we predicted the probability of graduating college based on the full model estimates in Model 8. Using the LINCOM procedure in Stata 10.0, we are able to get predicted probabilities for each level of parental health while controlling for the other variables in the model (estimated at the mean of each covariate) and adjusting for the complex survey design of the Add Health study. Figure 2 provides a graphical representation of the unadjusted compared to the fully adjusted estimates of the effect of parental health. As shown in the transition from Model 1 to Model 8, the magnitude of the association is significantly reduced and the error bars indicate that the fitted probabilities are significantly different in the two estimating procedures. Nevertheless, as described above, despite controls for respondent health, parental SES, community SES, parental and respondent health behaviors, and parental time investment, we continue to see a positive influence of parental health status on the likelihood that their children will graduate from college.

DISCUSSION

Health disparities by SES have persisted into the 21st century despite universal social safety nets such as Medicaid and Medicare; those with higher education, income, wealth, and occupational status tend to enjoy healthier lives (Cutler & Lleras-Mavey 2008; Marmot 2004). The bulk of the existing literature on this topic has explored these associations within one generation but, as shown here, parental health appears to influence the educational attainment of their children. To the extent that poor parental health is concentrated in the lower social strata, children of unhealthy parents may advance less far in school because of their lower socioeconomic background or their health rather than the influence of poor parental health *per se*. Taking this possibility into account, we find that parental socioeconomic status reduced the association of parental health and children's educational

attainment, but the association remained substantial. In the broader theoretical debate of whether poor health leads to lower SES or vice-versa, these study results provide unique support for an understudied aspect of selection. Poor health seems to impair the educational attainment of individuals (a key component of SES), albeit the poor health of individuals' *parents*. To the extent that poor health is transmitted across a lineage, it would be expected that the influence of poor health on the educational attainment on each successive generation would cumulate over time. Such a process would lead to a substantial concentration of poor health in the lower socioeconomic strata, a process would be difficult to detect with standard, intragenerational analyses.

What accounts for the influence of parental health on children's educational advancement? At least three factors warrant future research. While we adjust for family income, parental education, and community SES which are clearly associated with college matriculation (Turley, Santos, and Ceja 2006), we were not able to adjust our statistical models for family wealth. Others (Conley 2001) have shown a significant influence of total net worth that operates above and beyond household income, occupational status, and educational outcomes of the head of the household. The effects of net worth appear to be smaller than the effects of parental education, however, it is important to consider this omission when interpreting these results. Nevertheless, as we argue above, chronically poor health may significantly reduce the 'nest egg' of a household therefore it is possible that it is an important mediating rather than potentially confounding characteristic. Social support may also play a role, both in terms of the social support provided by parents and caregiving required by an unhealthy parent. Social support and encouragement provided by parents is required not only for a child to attend college but also for the child to see it through and earn a degree. Analysis of peer, teacher, and parent influence on adolescent's decisions to continue in college indicate that it is the parents who are most influential (Bank, Slavings, and Biddle 1990), and the college persistence literature points to parental support and involvement as a key factor in children's

college success (reviewed in Seymour and Hewitt 1997). A negative impact of poor health on parental support of their children's college efforts would party explain the influence of parental health on children's educational attainment. In addition, caregiving responsibilities may also play a role. An unhealthy parent places children at risk of taking on the role of parental caregiver, a role that for youth is stressful and associated with increased levels of anxiety and depression (Armistead, Klein, and Forehand 1995; Worsham, Compas, Ey 1997; Pederson and Reverson 2005) which may make it difficult for students to enroll in or complete college (Baus, Dysart-Gale, and Haven 2005). Although we control for parental time at Wave 1, we do not have any information about the time spent with students especially as they are preparing their applications for college enrollment. We encourage others to consider this factor in future research.

Finally, it is also possible that the association between parental health and offspring education is due to an unobserved mechanism that is shared by family members that causes both health and education. Because the source of the covariance between health and SES may be genetically oriented, researchers have used twin and sibling studies to examine the extent to which genetic factors associated with physical health are the same as those related to SES. With regards to this study, there is consistent evidence that genetic factors influence physical health (Johnson and Krueger 2005), health related behaviors (Boardman 2009), and SES (Nielsen 2006). Each phenotype has evidenced heritability estimates that range from .4-.7 suggesting that a large proportion of the total variance is due to additive genetic factors. More importantly, because these factors are highly intercorrelated and because each is highly heritable, some have tested the possibility that the genes linked to one phenotype are common to all; that is their association in the population may be due to a common genetic source rather than one causing the other. In one of the largest studies done on this issue, Silventoinen et al. (2004: 544) use two large twin registries in Minnesota and Finland and show that the correlation between body height and educational attainment is "overwhelmingly due

to the correlation of the shared environmental factors affecting these two traits." That is, while genetic factors may influence both health and SES, there is little evidence that the association between these two factors is due to common genetic origins. Nevertheless, genes linked with cognitive skills could prevent individuals from learning about or implementing healthy lifestyle choices and could also prevent individuals from succeeding economically (Fuchs 1982) which may produce health complications in early life. Although some have found evidence that this is not driving educational disparities in health (Link et al. 2008) it is nevertheless important to consider a variety of different explanations for the remaining association shown in Model 8 of Table 3.

In terms of policy our results indicate support for the notion that parental health should be included in the assessment of individual progress within educational settings. Thus, although individualized assessments are generally limited to students with diagnosed learning disabilities, parental health information could be obtained at enrollment time that may provide teachers and administrators with a more nuanced understanding of all student's home lives. Our results also suggest that improving the health of parents may also have important educational returns for their children. As such, one spillover of policies to improve the health of the population is the very real possibility that educational attainment of the population will increase as well. This is particularly important because large efforts to decrease health disparities may go a long way towards reducing educational disparities by race, ethnicity, and class (Farkas 2003).

Who gets ahead in the U.S. has long been of central interest to sociologists (Jencks 1980). While ambition and hard work certainly play a key role in socioeconomic advancement, so too do factors outside of the individual's control, such as parent's education and income. The results of this study indicate that parental health also independently affects individual status attainment, an influence that has received little recognition to date. We encourage researchers to further explore this association in an effort to identify the social, behavioral, or even biological mechanisms that

may support this association. Further, it is likely that this association varies considerably by race and gender. For example, does maternal health have the same influence on the educational attainment of boys and girls from the same family? This would be an important extension of the health disparities literature and the results from this paper provide a useful point of departure for future studies in this important area of research.

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Table 1. Descriptive statistics for all variables used in the analysis (n = 13,556).

	Mean	95% Confidence Interval	
		min	max
Parent health W1	3.599	3.575	3.623
Completed college by W4	0.299	0.288	0.309
Sex [Male]	0.507	0.496	0.519
Age W4	28.223	28.179	28.267
Race/Ethnicity			
Non-Hispanic and White	0.678	0.668	0.689
Non-Hispanic and Black	0.158	0.150	0.165
Hispanic	0.119	0.111	0.127
Other non-Hispanic race	0.043	0.039	0.048
Self-rated health W1	3.888	3.864	3.905
Δ Self-rated health W3-W1	-0.063	-0.087	-0.038
Parental education W1	13.998	13.947	1.16.049.16
Community SES W1	-0.019	-0.036	-0.002
ln(Parental income) W1	10.368	10.339	10.396
Parent smokes in HH W1	0.306	0.295	0.316
Parent obese in HH W1	0.192	0.183	0.200
Respondent smokes W3	0.354	0.343	0.365
Respondent obese W3	0.229	0.219	0.239
Respondent health W3	3.822	3.802	3.843
Time with parents W1	3.880	3.835	3.926

Note: all data come from the National Longitudinal Study of Adolescent Health (Harris 2003). All estimates are weighted and adjusted for the complex design of the study using the SVYSET commands in STATA 10.0 (Chantala and Tabor 1999).

Table 2. Proportion graduating from college by wave 4 as a function of wave 1 parental health

Parental Health	Total N	Proportion graduated college	95% Confidence interval	
			min	max
Poor	406	0.116	0.085	0.147
Fair	1521	0.160	0.142	0.178
Good	4237	0.243	0.230	0.256
Very Good	4515	0.338	0.324	0.352
Excellent	2877	0.414	0.396	0.432
Total	**13556**	**0.299**	**0.288**	**0.309**

Note: all data come from the National Longitudinal Study of Adolescent Health (Harris 2003). All estimates are weighted and adjusted for the complex design of the study using the SVYSET commands in STATA 10.0 (Chantala and Tabor 1999).

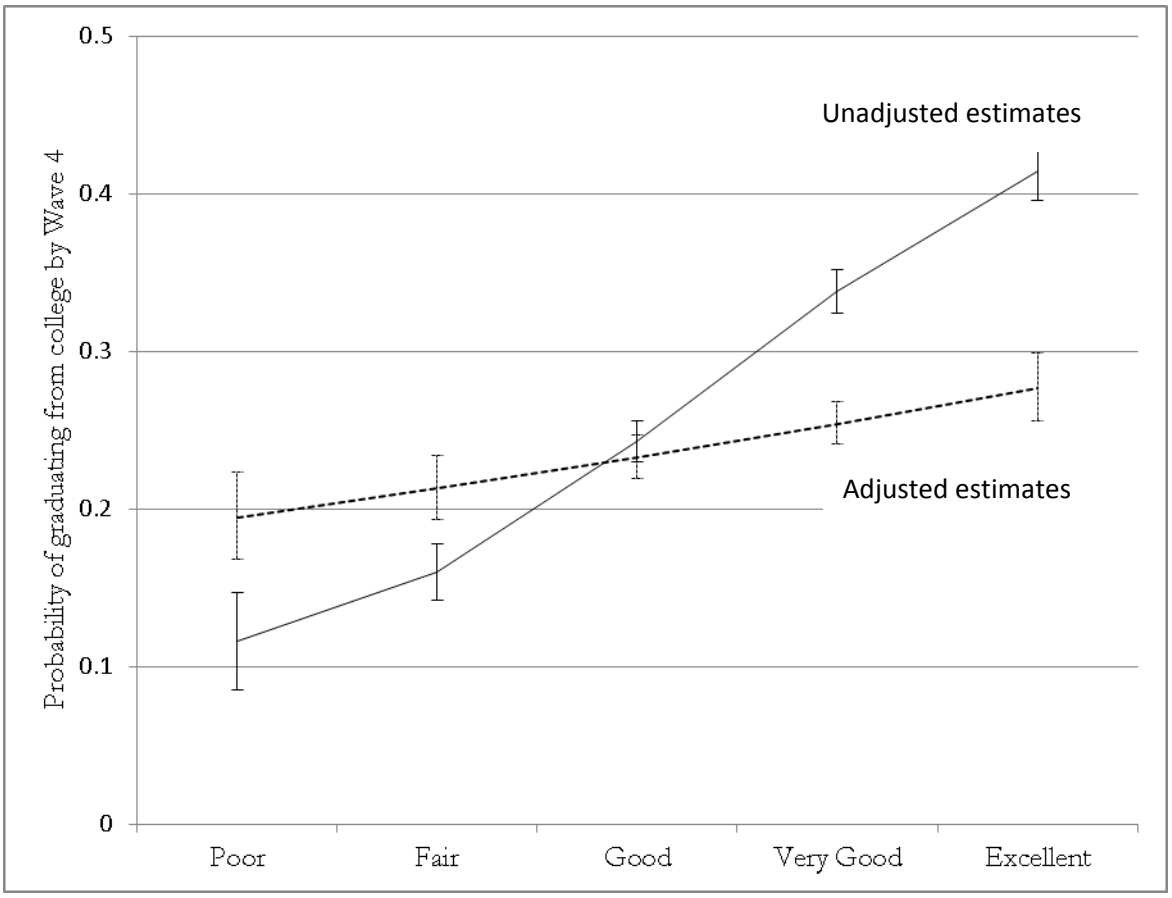
Table 3. Logistic regression estimates: the influence of Wave 1 parental health status on the likelihood of graduating from college by Wave 4.

	1	2	3	4	5	6	7	8
Parental health W1	0.423***	0.402***	0.349***	0.198***	0.155***	0.142***	0.119***	0.116***
	(0.026)	(0.027)	(0.027)	(0.029)	(0.029)	(0.030)	(0.032)	(0.032)
Gender (male)		-0.387***	-0.469***	-0.518***	-0.521***	-0.518***	-0.520***	-0.464***
		(0.052)	(0.053)	(0.056)	(0.057)	(0.057)	(0.058)	(0.059)
Age W4 (years)		0.002	0.007	0.019	0.015	0.014	0.007	0.013
		(0.014)	(0.015)	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)
NH Black		-0.478***	-0.502***	-0.395***	-0.159*	-0.108	-0.326***	-0.319***
		(0.069)	(0.071)	(0.072)	(0.075)	(0.075)	(0.079)	(0.079)
Hispanic		-0.653***	-0.645***	-0.272***	-0.202+	-0.171	-0.366***	-0.355**
		(0.089)	(0.092)	(0.105)	(0.107)	(0.107)	(0.111)	(0.112)
Other race/ethnicity		0.205+	0.237*	0.113	0.136	0.159	0.038	0.072
		(0.114)	(0.115)	(0.122)	(0.123)	(0.123)	(0.130)	(0.130)
Self-rated health W1			0.636***	0.590***	0.581***	0.577***	0.518***	0.504***
			(0.040)	(0.042)	(0.043)	(0.043)	(0.045)	(0.045)
Δ Self-rated health W3-W1			0.311***	0.309***	0.311***	0.306***	0.314***	0.309***
			(0.032)	(0.034)	(0.034)	(0.034)	(0.036)	(0.036)
Parental education				0.366***	0.252***	0.252***	0.240***	0.236***
				(0.014)	(0.017)	(0.017)	(0.018)	(0.018)
Neighborhood SES					0.599***	0.478***	0.466***	0.462***
					(0.053)	(0.061)	(0.063)	(0.063)
Ln(Income)						0.216***	0.198***	0.193***
						(0.059)	(0.056)	(0.055)
Parent smokes in HH (W1)							-0.465***	-0.460***
							(0.070)	(0.070)
Parent obese in HH (W1)							-0.155*	-0.170*
							(0.076)	(0.076)
Respondent smokes (W3)							-0.870***	-0.862***
							(0.066)	(0.066)
Respondent obese (W3)							-0.253***	-0.255***
							(0.079)	(0.080)
Time with parents (W1)								0.095***
								(0.014)
Constant	-2.413***	-2.069***	-4.485***	-9.334***	-7.495***	-9.655***	-8.232***	-8.638***
	(0.102)	(0.414)	(0.450)	(0.538)	(0.564)	(0.810)	(0.816)	(0.819)
Log Likelihood	-8149	-8018	-7771	-7078	-6947	-6913	-6669	-6631
Pseudo R-squared	.030	.046	0.0753	0.158	0.173	0.177	0.206	0.211

Note: all data come from the National Longitudinal Study of Adolescent Health (Harris 2003). All estimates are weighted and adjusted for the complex design of the study using the SVYSET commands in STATA 10.0 (Chantala and Tabor 1999).

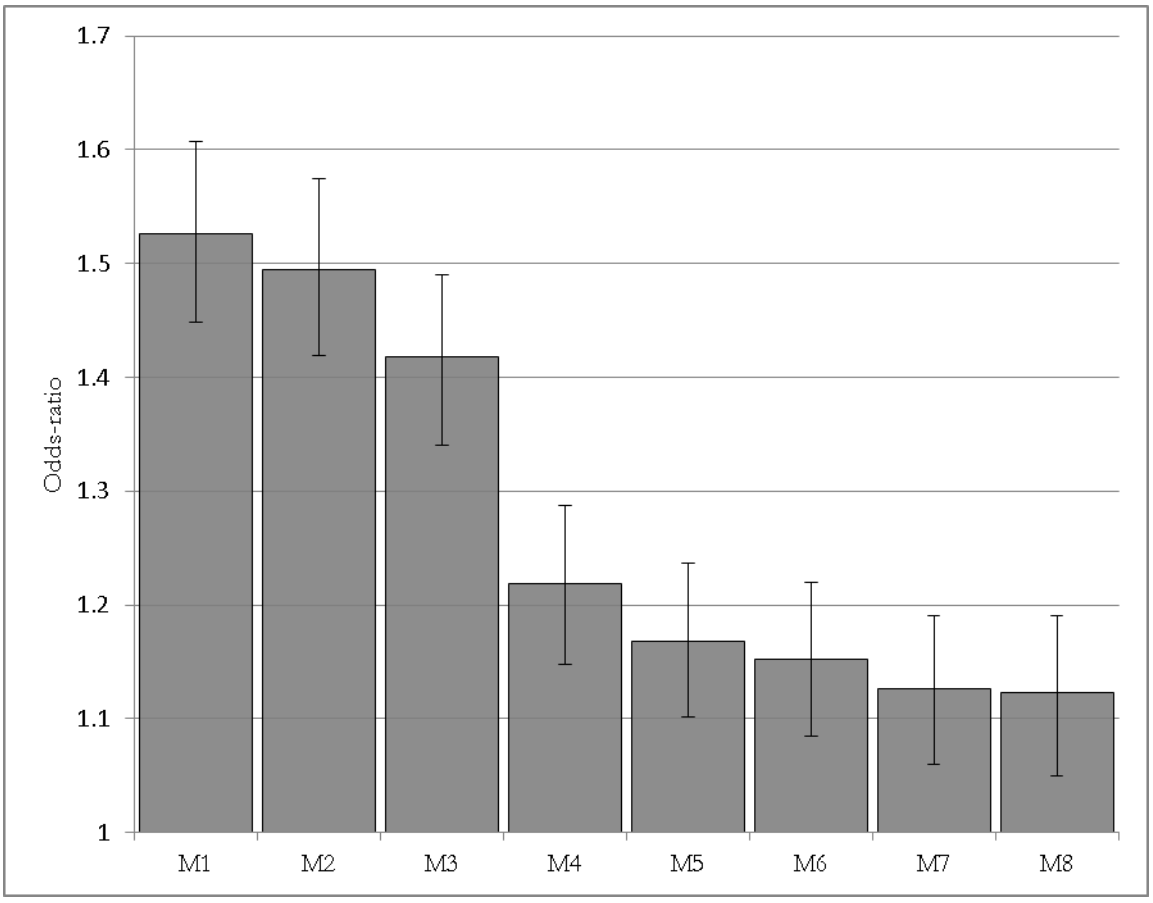
+ p< .10, * p<.05, ** p<.01, *** p<.001

Figure 1. Proportion of students who completed college by their late 20s as function of their parent's health during their teens.



Note: all data come from the National Longitudinal Study of Adolescent Health (Harris 2003). All estimates are weighted and adjusted for the complex design of the study using the SVYSET commands in STATA 10.0 (Chantala and Tabor 1999). The solid line presents the unadjusted proportion of respondents who completed college by Wave 4 as a function of their parent's health status in Wave 1. The dashed line presents the fitted probabilities of completing college by Wave 4 after controlling for the factors in Model 8 of Table 3.

Figure 2. Examining social and behavioral factors that mediate the link between parental health and offspring college graduation.



Note: all data come from the National Longitudinal Study of Adolescent Health (Harris 2003). All estimates are weighted and adjusted for the complex design of the study using the SVYSET commands in STATA 10.0 (Chantala and Tabor 1999). Estimates obtained from Models 1-8 in Table 3 and relate to the odds-ratios for completing college by Wave 4 as a funciton of parental health in Wave 1.