

Back to School:  
The Health Consequences of Returning to School After First Labor Force Entry

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## Abstract

This study examines whether the attainment of an additional educational degree after first labor force entry significantly improves health. On the one hand, theories that posit a causal influence of education on good health would predict health improvements among people who obtain additional degrees at any point in the life course. On the other hand, additional education may have no effect on health as a result of such factors as inertia in health habits and behaviors, little emphasis on health-related skills at lower and higher education levels, and/or self-selection of workers who were poor students the first time around. The analysis uses the longitudinal, nationally-representative Add Health study and focuses on approximately 12,000 respondents who were first interviewed in 1994-5 when they were in 7<sup>th</sup>-12<sup>th</sup> grade and last interviewed in 2007-2009. The health outcomes examined were self-rated health, body mass index (bmi), obesity, and hypertension stage 2. Acquisition of an additional educational degree after first labor force entry significantly improved all health outcomes examined, at least among people who entered the labor force with a high school/AA degree.

A return to school after first labor force entry has become increasingly common in recent decades. The “traditional” life course marked by completion of all educational attainment before labor force entry is nearing minority status, as about 46% of the student population now enters the labor force before pursuing postsecondary education (National Center for Education Statistics 2002). Further evidence that workers are returning to school comes from the U.S. Census, which reports that in 2008 37% of all college students are age 25 or older, up from 28% in 1972 (U.S. Census Bureau 2010). The transition from school to work is becoming increasingly reversible, a trend that has been long in the making and is expected to continue in the future as a result of economic restructuring and the decline of long term employment contracts. Most likely the current, Great Recession serves to accelerate this trend as newly unemployed workers return to school to learn new skills required by an ever-changing economy.

Whether a return to school improves workers’ health is an open question, and the topic of this study. On the one hand, the macrosocial trend toward increased educational attainment throughout the life course may lead to substantial improvements in individual and population health. People with higher education have better health (Pampel, Krueger, and Denney forthcoming), and theories that posit a causal link for this association (Link and Phelan 1995; Mirowsky and Ross 2003) would predict that a return to school should significantly and quickly improve workers’ health. On the other hand, delayed educational attainment that occurs after first labor force entry may have fewer or no health benefits. Inertia in health habits and behaviors may blunt the beneficial impact of education on health at later ages, the health benefits of delayed education may depend on level of education attained, and/or students who did not go straight through school

may be worse students and reap fewer benefits from additional schooling. To examine the impact of delayed educational attainment on health we draw on the Add Health study, which is a longitudinal, nationally-representative study of 7<sup>th</sup>-12<sup>th</sup> graders initially interviewed in 1994-5 and followed up four times, most recently in 2007-2009.

### **Theoretical Background**

One of the most prominent and specific theories to posit a causal association of education on health is the “personal control” hypothesis of Mirowsky and Ross (2003). They emphasize that education gives people the personal resources to be effective agents in their own lives and to take charge of their health lifestyle, which includes walking, exercising, drinking moderately, not smoking, and avoiding overweight. Workers who go back to school would be expected to develop more personal control and change their health habits for the better, leading to better overall health. Importantly, through empirical research Mirowsky and Ross highlight personal control as a key link between education and health that is more influential than other top contenders such as economic resources or employment.

A second, broader and less specific theory to posit a causal association of education on health is the “fundamental cause” hypothesis of Link and Phelan (1995). They posit that a variety of mechanisms link education to health, and strongly caution against trying to highlight any specific one as the main link. A mechanism such as personal control is clearly important, according to this perspective, but its mediating effect may vary across health outcomes, and its influence may be supplanted over time by new, emerging mechanisms. The ‘fundamental cause’ perspective places primary

emphasis on broad categories of resources such as beneficial social connections, power, and money, which are concentrated in the upper social strata and strongly predict health even as the profile of major diseases and conditions affecting a society change over historical time. The ‘fundamental cause’ perspective would predict that workers who go back to school attain more personal, social, and material resources and that their health will improve as a result. Further, the perspective posits that a variety of mechanisms link education to different health outcomes. Consequently, the failure to explain the association of SES and health with a single mechanism or variable is not a failure of theoretical development in the field, but is rather a testament to the powerful way in which education affects health through a diverse portfolio of links, which change over time.

One unique component of the ‘fundamental cause’ perspective is its focus on emerging associations of education with new health outcomes over historical time. The association of education and health has been remarkably persistent over the past century, according to this perspective, because as the association of education with health diminishes for some health outcomes it emerges in new ones. Consequently, the ‘fundamental cause’ perspective is receptive to, and indeed predicts that workers who go back to school would be protected from health threats and conditions that have newly entered a society.

Considerable reasons also exist to predict the alternative hypothesis that workers who return to school will *not* reap health benefits. Research on the life course timing of educational attainment indicates that people who return to school later in the life course realize fewer benefits than those who completed it earlier. In their analysis of wages,

Elman and O'Rand (2004) conclude that educational degrees men obtain prior to first regular job have the greatest impact on later-life wages, and that “newly acquired A.D. degrees, vocational certifications, or even new graduate or professional degrees do not significantly increase the hourly wages of men or women who return to school” (p.147). To the extent that later timing of educational attainment dilutes its positive effects, it is possible that workers who return to school may not accrue health improvements.

One reason later education may not impact health is what we term health behavior “inertia.” Health habits formed in early adulthood may be difficult to modify later in the life course as they become increasingly ingrained. Perhaps the clearest example of this idea is the health behavior of smoking, which typically starts early in the life course and is difficult to modify at later ages. More generally, to the extent that people’s self-identity – which includes health beliefs and practices – begins to crystallize in adolescence and becomes more stable with increasing age (Klimstra et al. 2010), it is plausible that education will be less successful in modifying health habits at later stages of the life course.

It is also possible that a return to school may have a less beneficial impact on health for workers at the lowest and highest educational levels. Educational institutions at lower levels such as vocational schools and private occupational colleges may place little emphasis on personal control, and focus instead on job skills (Person, Rosenbaum, and Regina 2005). If so, then the “personal control” hypothesis of Mirowsky and Ross (2003) would predict that workers who go back to school to attain these degrees would not see much improvement in health. At the other end of the spectrum, the highest levels of education, such as postbaccalaureate programs, may also not increase levels of

personal control to the extent that there is a theoretical maximum to how high it can rise. If so, then the “personal control” hypothesis would also predict that workers who go back to school for advanced educational degrees would obtain fewer health benefits.

A final reason that returning to school may not improve health is that the workers who return to school may be poor students and therefore less likely to take advantage of the opportunity to increase their personal, social, and material resources. U.S. students who delay college entry after high school for at least seven months performed significantly lower on standardized tests, they have previously dropped out of high school, and have lower odds of eventual bachelor degree completion (Bozick and DeLuca 2005). Further evidence that workers who return to school are a select subgroup comes from a longitudinal study of Finnish youth, which indicates that people with a trajectory of later-life educational attainment were more likely to have problems with low emotional self-control in childhood (Kokko et al. 2008). At least some of the workers who return to school were the ones who left in the first place because they did not like school and were not a good fit with the traditional educational system, and it is possible that these workers will be less able to successfully obtain the benefits that can come from additional education.

### *The Present Study*

This study contributes to the literature in two ways. First, to our knowledge this study is one of the first to examine whether workers who return to school significantly improve their health. The longitudinal data of this study allow us to examine changes in health before and after the completion of additional education completed after first labor

force entry. Second, in addition to focusing on the traditional outcome of self-reported health, we also examine body mass index (bmi) and obesity. By doing so we are responsive to the call to extend the outcomes repertoire in the sociological health disparities literature (Aneshensel 1992; Pearlin 1989), a call important to expand the scope and relevance of sociological disparities research.

## **Data and Methods**

### *Data*

The Add Health Study was based initially on a nationally representative sample of youth in grades 7 through 12 in the United States. The National Quality Education Database provided the sampling frame with its list of all high schools in the United States (N=26,666). From this frame 80 schools were selected. The sample was stratified by region, suburban/urban/rural, school type (whether public, private, parochial), ethnic mix, and size. Fifty-two of the 80 schools agreed to participate, and 28 replacement schools were selected based on the stratifying variables. Each of the 80 schools was paired with a middle school (based on its contribution to the high school student body). A total of 145 of the schools agreed to host a confidential in-school survey, which focused on adolescent health and friends. This first wave yielded 90,118 students from grades 7 to 12 (in 1994).

From the school rosters, students were randomly selected for a one and one-half hour interview, conducted in the home. Approximately 200 students were recruited from schools in each school pair, regardless of size. This procedure resulted in a self-weighting sample. A total of 20,745 adolescents in grades 7 through 12 (ages 11 through 19) were

interviewed at home. This in-home wave of interviews with target child and parent was carried out in 1995, between April and December. The present paper draws upon data collected in Wave IV. Of the eligible respondents who had participated in the first in-home interview, 92.5% were re-located and 80.3% were re-interviewed, resulting in 15,701 adult in-home interviews collected between January 2008 and February 2009. Survey data were collected using a 90-minute CAPI/CASI instrument

### *Measures*

**Self-reported health** is measured in waves 3 and 4 as the answer to the question “In general, how is your health?” to which respondents answered excellent (1), very good (2), good (3), fair (4), or poor (5). **Body Mass Index (BMI)** is objectively measured by survey staff at both waves 3 and 4. It is calculated as weight (in kilograms) divided by height (in meters) squared. **Obesity** is coded 1 for respondents with a BMI score of 30 or greater and 0 otherwise. **Hypertension Stage II** was measured by Add Health staff only at wave 4 and is coded 1 for respondents with a systolic pressure of 160+ or diastolic pressure of 100+ and coded 0 otherwise.

Education is divided into three categories. **Bachelor’s+** is coded 1 for respondents who have a bachelor’s degree, a master’s degree, a Ph.D., or a professional degree such as J.D. or M.D and coded 0 otherwise. **High school/AA** is coded 1 for respondents who report that their highest level of educational attainment is a high school degree, a G.E.D., a vocational degree, or an AA degree, and is coded 0 otherwise. “< **High school/AA**” is coded 1 for respondents who report no educational credentials and coded 0 otherwise. **More education** is coded 1 for respondents who obtained a new

educational degree after first labor entry and 0 otherwise. Specifically, it is coded 1 for: (a) respondents whose educational level at first labor force entry was < **High school/AA** but later earned a degree that would qualify them as **High school/AA** or **Bachelor's+**, (b) respondents whose educational level at first labor force entry was **High school/AA** but later returned to school and obtained a degree that would qualify them as **Bachelor's+**, and (c) respondents whose educational level at first labor force entry was **Bachelor's+** and later attained an additional advanced degree.

**Female** is coded 1 for women and 0 for men. **Black** is coded 1 for black respondents and 0 otherwise, and **Hispanic** is coded 1 for Hispanic study members and 0 otherwise. **Parent has college education or more** is coded 1 for respondents whose main parent (usually the mother) has a college education and 0 otherwise. **Household income** is a measure of the study member's family income at wave 1 and is reported in 1000's.

**Poor school adjustment** is the sum of the responses to the questions "Since school started this year, how often have you had trouble:" (a) getting along with your teachers, (b) paying attention in school, (c) getting your homework done, (d) getting along with other students? All questions were scored on the scale of never (0), just a few times (1), about once a week (2), almost everyday (3), everyday (4). **Poor school attachment** is the sum of the responses to the questions "How much do you agree or disagree with the following statements:" (1) You feel close to people at your school, (2) You feel like you are part of your school, (3) Students at your school are prejudiced [scores reversed], (4) You are happy to be at your school, (5) The teachers at your school treat students fairly, (6) You feel safe in your school." All questions were scored on the

scale of strongly agree (1), agree (2), neither agree nor disagree (3), disagree (4), strongly disagree (5). The **picture vocabulary score** is the respondent's standardized score on the Add Health picture vocabulary test, which is an abridged version of the Peabody vocabulary test-revised.

### *Analytic Strategy*

This study uses OLS and logistic regression model wave 4 health outcomes as a function of education before and after labor force entry. The models include controls for the health outcomes at wave 3, and therefore the coefficients in the models predict change in health status between the two waves. All models also include demographic controls.

### **Results**

-- Table 1 About Here --

Table 1 presents comparisons based on baseline characteristics of people who eventually went back to school and obtained higher educational degrees over the course of the survey with those who did not. These results indicate that the respondents who ended up going back to school had higher socioeconomic status and were better adjusted to school than those who did not. At Wave 1, when respondents were in 7<sup>th</sup>-12<sup>th</sup> grade, those who would later go back to school had significantly higher parental education, and also had higher household income. These students also scored higher in their baseline adjustment to and attachment to school. Finally, the study members who would

eventually go back to school and successfully acquire an educational degree scored higher on the Add Health picture vocabulary test, a measure of scholastic achievement.

-- Table 2 About Here --

Table 2 presents the results of going back to school and obtaining an additional, higher educational degree on the health outcomes of self-rated health and bmi. The results indicate that additional education after first labor force entry had a strong, positive effect on health, at least for people who had a high school/AA degree at time of labor force entry. In the context of the interactions in Table 2, the coefficient for the variable “More Education” refers to people who had high school/AA degree when they entered the labor force. Among these study members, a return to school is associated with a 0.294 increase in self-rated health after controlling levels of self-rated health at wave 3. These study members also experienced a decline in BMI of 1.18 points, after controlling for BMI levels at wave 3.

The interaction terms in Table 2 measure the effect of additional education for people who had less than or more than a high school degree/AA at the time of labor force entry. The effect of additional education on self-rated health for study members with a Bachelor’s degree or higher at labor force entry is .043. This is calculated as  $.294 - .251$ , which is the effect of the “More Education” variable (coded 1 for all respondents who got more education) added to “(More Education)\*(Bachelor’s+ pre-labor force),” which is the effect specific to people with a Bachelor’s degree or more at labor force entry. Analysis (not shown) indicated that this effect was not significantly different from 0. The

effect of additional education for study members with no educational credentials at labor force entry is .146 (.294-.148), which is significantly different from zero ( $p < .03$ , analysis not shown).

The analysis results for bmi in Table 2 are similar to that for self-rated health. The beneficial effect of additional education is concentrated among study members who had a high school degree/AA at the time of labor force entry. In this case, no effect of additional education on bmi is apparent for the study members who have lower or higher levels of education at baseline.

-- Table 3 About Here --

Table 3 presents parallel results for the outcomes of obesity and hypertension, stage 2. The results for obesity show that additional education reduces the changes of obesity at wave 4 for people whose educational status at labor force entry was a high school degree/AA. Additional education had smaller or no effect on obesity for study members with lower or higher education levels at labor force entry. Finally, for the outcomes of hypertension stage 2, additional education predicted lower risk for study members with a high school degree/AA or no educational credentials at labor force entry.

## **Discussion**

This paper set out to examine whether a return to school in order to obtain an additional educational degree after first labor force entry delivers a health benefit. To address this question we used longitudinal data that followed a nationally-representative

sample and assess health at multiple time points. The analysis focuses on the health outcomes of self-rated health, bmi, obesity, and hypertension stage 2.

The results indicate that a return to school after first labor force entry significantly improved health, at least for people who entered the labor force with a high school degree/AA. Across all four health outcomes, people with a high school/AA degree who returned to school and obtained a Bachelor's degree or higher experienced significant improvements in health.

In the coming months we will elaborate on this in more detail!

## References

- Aneshensel, Carol S. 1992. "Social Stress: Theory and Research." *Annual Review of Sociology* 18:15-38.
- Bozick, Robert and Stefanie DeLuca. 2005. "Better Late than Never? Delayed Enrollment in the High School to College Transition." *Social Forces* 84:527-549.
- Elman, Cheryl and Angela M. O'Rand. 2004. "The Race Is to the Swift: Socioeconomic Origins, Adult Education, and Wage Attainment." *American Journal of Sociology* 110:123-60.
- Klimstra, Theo A., William W. Hale, Quinten A. W. Raaijmakers, Susan J. T. Branje, and Wim H. J. Meeus. 2010. "Identity Formation in Adolescence: Change or Stability?" *Journal of Youth and Adolescence* 39:150-162.
- Kokko, Katja, Lea Pulkkinen, Päivi Mesiäinen, and Anna-Liisa Lyyra. 2008. "Trajectories Based on Postcomprehensive and Higher Education: Their Correlates and Antecedents." *Journal of Social Issues* 64:59-76.
- Link, Bruce G. and Jo Phelan. 1995. "Social Conditions as Fundamental Causes of Disease." *Journal of Health and Social Behavior* (Extra Issue):80-94.

Mirowsky, John and Catherine E. Ross. 2003. *Education, Social Status, and Health*. New York: Aldine de Gruyter.

National Center for Education Statistics, U. S. Department of Education. 2002.

*Nontraditional Undergraduates*, Edited by S. Choy. Washington, DC: U.S.

Department of Education.

Pampel, Fred C., Patrick M. Krueger, and Justin T. Denney. forthcoming. "SES

Disparities in Health Behaviors." *Annual Review of Sociology*.

Pearlin, Leonard. 1989. "The Sociological Study of Stress." *Journal of Health and Social Behavior* 30:241-256.

Person, Ann E., James E. Rosenbaum, and Deil-Amen Regina. 2005. "Colleges, Careers, and teh Institutional Structuring of the Transition to Adulthood." *Advances in Life Course Research* 9:125-149.

U.S. Census Bureau. 2010. "Table A-6 Age Distribution of College Students 14 Years Old and Over, by Sex: October 1947 to 2008." vol. 2010: U.S. Census.

Table 1: Comparison of People Who Went Back To School and Got Higher Degrees with Those Who Did Not: Mean Comparisons on Selected Characteristics

-----Educational Status at Labor Force Entry -----

Variable	No Educational Degrees		High School, Vocational, or AA Degree		Bachelor's Degree or Higher	
	No additional education	Attained higher degree	No additional education	Attained higher degree	No additional education	Attained higher degree
% of sample	6	12	51	8	19	3
Female	.438	.412	.507	.527	.570	.630
Black	.209	.204	.162	.136	.104	.107
Hispanic	.178	.154	.122	.102	.058	.063
Parent has college education or more	.042	.101**	.141	.303**	.414	.509*
Household income at wave 1 (in 1000s)	25.6	34.7**	40.6	54.7**	67.0	79.4
<i>School variables (from wave 1, when sample in 7<sup>th</sup>-12<sup>th</sup> grade)</i>						
Poor school adjustment	5.77	4.85**	4.28	3.74**	3.61	3.69
Poor school attachment	15.8	15.3	14.8	14.3*	13.8	13.8
Picture vocabulary test	88.9	96.7**	100	107**	109	112**

\* p<.05, \*\* p<.01: Group that attained higher degree significantly different from group that did not.

Table 2: Effect of Additional Education after First Labor Force Entry on Selected Health Outcomes; Results from OLS Regression Equations (Standard Errors in Parentheses)

Variable	Good self-rated health (n=12,028)	BMI (n=11,337)
<i>Additional Education Degree Attained after First Labor Force Entry</i>		
(More Education) <sup>††</sup>	0.294*** (0.0398)	-1.18*** (0.249)
(More Education) * (Bachelor's+ pre-labor force)	-0.251*** (0.0622)	1.24** (0.471)
(More Education) * (< High school/AA pre-labor force)	-0.148 (0.0771)	1.38** (0.477)
<i>Education Attained Before Labor Force Entry</i>		
High school/AA	reference	reference
Bachelor's +	0.297*** (0.0263)	-1.35*** (0.212)
< high school/AA	-0.22*** (0.0553)	-0.411 (0.386)
Wave 3 measure of outcome	0.377*** (0.0137)	0.554*** (0.0357)
Parent Education	0.0437** (0.0167)	-0.302* (0.146)
Female	-0.0357 (0.0194)	0.155 (0.142)
Black	-0.118*** (0.0258)	1.1*** (0.231)
Hispanic	-0.132*** (0.0399)	0.484** (0.172)
Age	-0.00707 (0.00582)	-0.0208 (0.0376)
Constant	2.27*** (0.181)	15.3*** (1.34)
R <sup>2</sup>	.19	.47

\* p<.05; \*\*p<.01; \*\*\*p<.001

<sup>††</sup> In the context of the other interactions in the model, this variable refers to the effect of additional education on the health of respondents who a high school degree/AA at labor force entry.

Table 3: Effect of Additional Education after First Labor Force Entry on Selected Health Outcomes; Results from Logistic Regression Equations (Standard Errors in Parentheses)

Variable	Obese (n=11,337)	Hypertension II (n=11,288)
<i>Additional Education Degree Attained after First Labor Force Entry</i>		
(More Education) <sup>††</sup>	-0.561*** (0.142)	-0.758* (0.3)
(More Education) * (Bachelor's+ pre-labor force)	0.555* (0.248)	-0.069 (0.672)
(More Education) * (< High school/AA pre-labor force)	0.449 (0.239)	0.588 (0.467)
<i>Education Attained Before Labor Force Entry</i>		
High school/AA	reference	reference
Bachelor's +	-0.467*** (0.0957)	-0.452* (0.181)
< high school/AA	-0.0477 (0.155)	0.254 (0.291)
Wave 3 measure of outcome	3.56*** (0.102)	
Parent Education	-0.0952 (0.0645)	0.148 (0.104)
Female	-0.0479 (0.0647)	-0.569*** (0.154)
Black	0.333*** (0.0807)	0.411** (0.154)
Hispanic	0.156 (0.105)	-0.0142 (0.218)
Age	-0.00826 (0.0198)	0.105** (0.0391)
Constant	-0.865 (0.574)	-6.05*** (1.11)

\* p<.05; \*\*p<.01; \*\*\*p<.001

†† In the context of the other interactions in the model, this variable refers to the effect of additional education on the health of respondents who a high school degree/AA at labor force entry.