

Postsecondary Academic Experiences in the Link between Education and Health

Introduction

The positive association between education and health is well documented across time, place and population. Those with higher levels of education and/or more years of schooling are healthier than individuals with lower amounts of education (Mirowsky and Ross 2003). Even controlling for income, researchers find health benefits for individuals with higher education, suggesting that education itself has an effect on health beyond its economic benefits (Cutler and Lleras-Muney 2010; Mirowsky and Ross 1998). The disparities between the highest and lowest educated are growing, and the role that education plays in maintaining a healthy life is increasing across cohorts (Lynch 2003).

Although decades of research have investigated the relationship between education and health using different health outcomes and varying measures of education, the actual educational mechanisms through which health is affected are poorly understood. The assumption is that increases in the time spent in formal schooling affects capacities for critical thinking, as well as feelings of autonomy over one's life which in turn improves overall health (Mirowsky and Ross 2003). However, educational research has found that limited learning occurs over the course of postsecondary enrollment (Arum and Roksa 2011), and enrollment patterns in college are far from linear (Milesi 2010). The current study conceptualizes exposure to postsecondary education using detailed academic measures that more accurately capture how students experience time in postsecondary school, including both the quantity and quality of courses completed. Both of these concepts of postsecondary schooling can help refine our understanding of exactly *how* education past high school may improve later life health.

Literature Review

Years of Education and Health. Many health researchers find that a measure of quantity of schooling—usually operationalized as years of schooling—may be the most accurate model of the relationship between education and health. Those with more years of schooling have longer life expectancies (Meara et al. 2008) and lower rates of morbidity during old age (Mirowsky and Ross 2008). More educated adults report better physical functioning, and general self-reported health (Ross and Mirowsky 1999). Years of schooling are also associated with lower rates of specific illnesses. When measured linearly, there is a consistent increase in health with each year of completed schooling (Ross and Mirowsky 1999). Reynolds and Ross (1998) find that both physical and psychological well-being increase with each year of schooling at a magnitude greater than all other controls other than age.

When education is represented as a continuous measure of number of years of completed schooling, the theoretical assumption is that exposure to formal education actually increases an individual's capacity for beneficial returns (social or economic). In this view, the process of formal education actually affects the capacities and abilities of individuals, imparting both cognitive and non-cognitive skills to the student (Kerckhoff 1976). As most health research uses reports of years of total education, the assumption is that higher quantities of education represent higher intellectual capacities, and more control over life decisions (Mirowsky and Ross 2003; Ross and Mirowsky 1999).

Much educational research supports the idea that a measure of education as an accumulation of time is an accurate proxy for a higher skill set. Not only does schooling teach skills and knowledge specific to course subjects (e.g. English, Literature, Geometry, Biology),

but it develops the skill of how to learn and how to think critically (Hyman 1975). The more educated have developed analytic skills that allow them to analyze and solve problems (Kohn and Schooler 1982). Months of schooling in the K-12 academic year are associated with gains in math and reading ability (Heyns 1978). Just as schooling imparts specific knowledge, it also teaches (often implicitly) many non-cognitive skills. Students are taught to value independence, motivation and achievement—concepts that affect many later life opportunities (Dreeben 1968).

Postsecondary schooling. Although research shows increases in learning with time spent in primary and secondary school, there are not clear linear patterns in postsecondary schooling. In fact, Arum and Roksa (2011) in a study of 24 4-year colleges and Universities find that about 45% of 4-year college students in their sample did not exhibit a statistically significant improvement in general analytical competencies in their first two years of enrollment (pg. 121). Additionally, the way that students enroll in postsecondary education is different from primary and secondary school in that they are able to enroll part-time or withdraw from some courses once the academic year begins (Goldrick-Rab 2006; Horn and Carroll 1996; Milesi 2010). These enrollment patterns complicate the experience of higher education, as students may be enrolled in college over several years, but accumulate courses needed to earn a degree at a slower rate (Adelman 2004). A measure of total years enrolled thus may misrepresent what a student has actually gained from their particular enrollment trajectory

There are also large differences in quality of schools and courses in postsecondary education that create large variation in the opportunities to learn certain skills in college. Close to 40% of college students are enrolled in “open enrollment” 2-year schools (Snyder and Dillow 2012), in which there is no certain level of prior skill the student needs in order to enroll other than a high school diploma. Additionally many students enroll in remedial-level courses which in college that do not provide postsecondary-level instruction (Rosenbaum, Deil-Amen and Person 2009).

Taken together, health research shows clear increases in both health and the mechanisms that could lead to better health higher amounts of education (Mirowsky and Ross 2003), however educational research questions how exactly this happens during postsecondary enrollment. The current study aims to piece apart the academic processes that are at work during enrollment in postsecondary schooling, including number of credits earned, types of courses taken and grades earned in order to better understand how education past high school is beneficial for health.

Research Questions

First, I will use reports of the number of postsecondary courses taken (and their corresponding credit-hour values) to examine the effects of actual quantity of postsecondary exposure on early adult health. The quantity of course-taking allows for differentiation within the large group of young adults who entered college but did not earn a degree (the “some college” group). These analyses will answer the following question:

RQ 1: Is the number of course credits earned in postsecondary schooling associated with better health in early adulthood? Does the effect vary by courses taken in 2- or 4-year schools?

Second, I will look at aspects of the postsecondary academic experience that may lead to increased critical thinking skills. These analyses will focus on the quality of the course and the

academic experience by using measures of course type, and grades earned. Specifically, I ask the following questions:

RQ 2: Are type of courses (remedial vs. academic) taken in post-secondary schooling associated with health in early adulthood?

RQ 3: Are the grades earned in postsecondary courses associated with health in early adulthood?

Finally, the previous questions will be framed within both health and education stratification literature that claims educational effects on health may be due to selection effects or credential effects (signaling). Therefore I also ask the following question:

RQ 4: Does quantity and quality of postsecondary course-taking have an effect on early adult health net of education and health selection and degree earned?

Data and Methods

Data. I use the National Longitudinal Survey of Youth 1997 (NLSY97) to investigate my research questions. The NLSY97 is a nationally representative longitudinal sample of youth born between the start of 1980 and the end of 1984. The NLSY97 first surveyed respondents in 1997 when they were between the ages of 12-18. They are sampled yearly, and the most recent data release is from 2011 (Round 15) in which the respondents were between the ages of 26-32. Round 1 included 8,984 respondents.

The NLSY97 is especially suited to examine questions of education and early adult health. A self-report of general health is collected from all respondents at every round. Thus, I am able to control for prior health status in all analyses. Additionally, this dataset contains detailed measures of postsecondary experiences and attainment, including information on each institution attended by the respondent, information on each term attended, and a series of monthly event history variables tracking postsecondary enrollment. In September of 2013, a postsecondary transcript file was released with information on the courses taken by students, including the course type and academic performance in the course.

Measures. The dependent variable for all analyses is a measure of self-reported general health. The responses range from excellent to poor (1=excellent; 2=very good; 3=good; 4=fair; 5=poor). This question is asked of all respondents at every wave. Although by definition, this is a subjective measure of individual health, self-rated health is correlated with many measures of specific health factors, including disease, disability and functional limitation (Johnson and Wolinsky 1993), implying these self-reports of health are objectively valid. For most analyses, I recode this response in to a measure of “good health” in which excellent, very good and good health are coded as 1, and fair and poor health are equal to 0.

The key independent variables for the proposed study include several measures of postsecondary enrollment and attainment. All postsecondary variables are measured after high school completion as defined by the date a GED or high school diploma was granted. In an attempt to measure the quantity of time enrolled, I use a measure of total credits earned toward a two-year degree, and total credits earned toward a four-year degree.

Using the postsecondary transcripts I measure the number of remedial and academic courses taken. Also, I create a grade point average for the respondent’s postsecondary course

taking by converting letter grades to grade points (A=4.0; B=3.0; C=2.0; D=1.0; F=0.0) and calculating the average over the total courses taken.

I also include controls for highest credential earned, gender, race/ethnicity, parent's highest education level and household income. I will also consider a control for prior health measured when the respondent was age 16 (measured on the same scale as the dependent variable). High school achievement controls are measured with an indicator of completion of college prep math (above algebra II), and overall high school GPA on a 4.0 scale.

Analytic Plan. First, I perform logistic regression predicting “good health” on the sample of respondents who received a high school diploma or GED, and thus were eligible for enrollment in postsecondary schooling. I regress being in good health at the outcome on the background characteristics and the number of college credits earned in both 2- and 4-year colleges.

The next round of analyses is performed only on respondents who had ever enrolled in a postsecondary institution after high school completion. Among these students I first look at the number of remedial and academic-level courses taken by the student in a postsecondary institution and whether these are associated with better early adult health. Next I look at the GPA earned in courses completed, separated by remedial and academic courses.

Preliminary Findings

Table 1 shows the results from a series of logistic regressions predicting self-reported “good” health in young adulthood using course credits earned and highest degree earned. Model 1 includes course credits earned (as well as the controls listed at the bottom of the table) and shows that 4-year course credits are associated with reporting good health in early adulthood. Model 2 shows that the positive effect of 4-year credits remains even when considering highest degree earned, although the effect is slightly attenuated. The final model includes interactions between degree earned and course credits and shows that the positive effect of 4-year credits on good health is actually less positive for those who earn a Bachelor's degree (as compared to those who don't earn any degree).

Future Plans and Significance

Future analyses will include exploration of the relationship between course type (remedial and academic) and GPA. Also, missing values will be taken into account through multiple imputation. The findings from this work will inform health disparities literature by pinpointing specific aspects of the postsecondary academic experience that are related to early adult health. Additionally, it does so while considering the actual trajectories taken through postsecondary enrollment and how they differ from education in primary and secondary schooling.

The preliminary findings already provide a more detailed explanation of how postsecondary schooling may affect health in that I find no association between credits earned toward a 2-year degree and later health. Additionally, the positive effect found for 4-year credits is greater for those who do not earn a Bachelor's degree, implying that a human capital argument of more education benefiting early adult health may apply only to those who do not earn a credential.

Table 1: Logistic Regression Predicting “Good Health” at age 26-28			
	Course Credits	Full Model	Interaction Model
Degree (ref. HS diploma)			
Associates/Junior College Degree		1.099	1.026
Bachelor’s Degree		1.513**	2.282***
Graduate Degree		1.848**	1.176
Credits Earned			
2-year credits	1.001	1.000	1.001
4-year credits	1.010***	1.003*	1.003*
Interactions			
AA*2-year credits			0.998
BA*2-year credits			0.996
Grad*2-year credits			1.001
AA*4-year credits			1.004
BA*4-year credits			0.985*
Grad*4-year credits			1.003
N=4933; Models also control for: health status at wave 1, gender, age at wave 1, race/ethnicity, parent’s highest education level, HS grades, employment status at age at outcome			

Works Cited

Adelman, Clifford. 2004. "Principal Indicators of Student Academic Histories in Postsecondary Education, 1972-2000." Washington, DC: Department of Education, Institute of Education Sciences.

Arum, Richard, and Josipa Roksa. 2011. *Academically adrift: Limited learning on college campuses*: University of Chicago Press.

Cutler, D.M., and A. Lleras-Muney. 2010. "Understanding differences in health behaviors by education." *Journal of health economics* 29(1):1-28.

Dreeben, Robert. 1968. *On what is learned in school*: Addison-Wesley Reading, MA.

Goldrick-Rab, Sara. 2006. "Following Their Every Move: An Investigation of Social-Class Differences in College Pathways." *Sociology of Education* 79(1):61-79.

Heyns, Barbara. 1978. *Summer learning and the effects of schooling*. New York, NY: Academic Press

Horn, Laura J, and C Dennis Carroll. 1996. *Nontraditional Undergraduates: Trends in Enrollment from 1986 to 1992 and Persistence and Attainment among 1989-90 Beginning Postsecondary Students. Postsecondary Education Descriptive Analysis Reports. Statistical Analysis Report*: ERIC.

Hyman, Herbert H. 1975. "The enduring effects of education."

Johnson, Robert J., and Fredric D. Wolinsky. 1993. "The Structure of Health Status Among Older Adults: Disease, Disability, Functional Limitation, and Perceived Health." *Journal of health and social behavior* 34(2):105-21.

Kerckhoff, Alan C. 1976. "The Status Attainment Process: Socialization or Allocation?" *Social Forces* 55(2):368-81.

- Kohn, Melvin L., and Carmi Schooler. 1982. "Job Conditions and Personality: A Longitudinal Assessment of Their Reciprocal Effects." *American Journal of Sociology* 87(6):1257-86.
- Milesi, Carolina. 2010. "Do all roads lead to Rome? Effect of educational trajectories on educational transitions." *Research in Social Stratification and Mobility* 28(1):23-44.
- Mirowsky, John, and Catherine E. Ross. 1998. "Education, personal control, lifestyle and health: a human capital hypothesis." *Research on Aging* v20(n4):p415(35).
- . 2003. *Education, Social Status and Health*. New York, NY: Aldine de Gruyter.
- . 2008. "Education and Self-Rated Health: Cumulative Advantage and Its Rising Importance." *Research on Aging* 30(1):93-122.
- Reynolds, John R., and Catherine E. Ross. 1998. "Social Stratification and Health: Education's Benefit beyond Economic Status and Social Origins." *Social Problems* 45(2):221-47.
- Rosenbaum, James E., Regina Deil-Amen, and Ann E. Person. 2009. *After Admission: From College Access to College Success*. New York, NY: Russell Sage Foundation.
- Ross, Catherine E., and John Mirowsky. 1999. "Refining the Association between Education and Health: The Effects of Quantity, Credential, and Selectivity." *Demography* 36(4):445-60.
- Snyder, Thomas D., and Sally A. Dillow. 2012. "Digest of Education Statistics, 2011." Washington, DC: National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education.