Is Attendance All that Matters? The Relationship Between High School Grades and Later-Life Health Outcomes

Lauren Hersch Nicholas, University of Michigan

Gunnar Malmberg, Umeå University

Dramatic differences in life expectancy and self-reported health status across levels of educational attainment have been well-documented in the United States, Canada and Europe (see Cutler and Lleras-Muney, 2009 for a summary). Additional years of schooling are associated with improved health outcomes, though there is limited evidence that more education *causes* better health. Recent studies testing the health effects of changes in compulsory education laws fail to find a health effect of mandated increases in education (Albouy and Lequien, 2009; Clark and Royer, 2012). These studies suggest the returns to additional education vary with individual characteristics, and students who are least engaged in school (most likely to drop out) have lower returns to education than more motivated students.

Research increasingly suggests a separate role for cognitive ability in mediating the relationship between educational attainment and health, though relatively few studies have had access to separate measures of student ability, particularly those measured at the time of educational decisions (Auld and Sidhu, 2005). Furthermore, studies typically lack access to comprehensive information about long-term health outcomes matched to individual measures of educational attainment and success. Individual traits such as perseverance and conscientiousness can influence both a student's academic success and their health.

In this paper, we take advantage of a unique Swedish administrative dataset that includes high school grades from the birth cohorts of 1972 – 1975 linked to information about parents and siblings from the Multigenerational Register, employment outcomes and vital statistics from

Statistics Sweden registers and mortality data from the Death Cause Register. We focus on the more than 80,000 Swedes with at least 1 sibling in the dataset. Use of mother fixed effects allows us to control for shared genetic factors and socioeconomic status measures that cannot be observed in the data.

We focus on three measures of adult health status: death after age 25 (mortality data are available through 2006, so we observe our cohort to a maximum age of 37; and for those who ever enter the labor force, two measures of health reflecting ability to hold a job. The first is whether a worker receives sickness allowance for more than 5 days in a given year. Swedish workers have generous sick leave policies covering normal absences for illness and injury, they do not receive the Federal sickness allowance unless they have a more severe condition requiring extended absence from work. We also consider whether the worker has claimed early retirement benefits due to disability by 2006. Mortality is relatively rare in our age group, only 0.4% of the cohort dies during the study period. 36% experience at least one period of extended illness and 3.2% claim early retirement benefits.

We first confirm that the Swedish data exhibit the expected gradient in years of education. Our main analysis then focuses on understanding the extent that health outcomes vary with performance within levels of education. Figure 1 describes the unadjusted relationships; there is little variation in risk of early mortality across quartiles of high school GPA, but students in the lowest GPA quartile are considerably more likely to become disabled and claim early retirement.

We formally test the relationship between high school grades and later health outcomes by estimating regressions of the form

$$H_i = \alpha \Sigma\, GPA_i + \beta College_i + \delta Female_i + \gamma Family_i + M + Y_i + \varepsilon_i$$

where H represents the health outcomes previously described, ΣGPA is a vector of dummy variables indicating quartile of high school GPA, college indicates college completion, family is a vector of family characteristics for each individual including paternal education and sibship, M is a vector of mother fixed effects, and Y is a vector of year of birth indicators.

We find that better performance in high school is associated with a lower probability of adverse health events connected to the labor market (Table 1). Relative to students who do not graduate high school, students in the lowest quartile of GPA are 3.9 percentage points less likely to receive sickness allowance and 3.5 percentage points less likely to take early retirement, those in the highest GPA quartile are 10.7 percentage points and 4.6 percentage points less likely respectively. The mortality effect, however, does not vary with high school GPA. High school graduates are 0.04 percentage points less likely to die between 25 and 37 than non-graduates regardless of grades in high school.

These results suggest that grades are most important for labor force linked outcomes, possibly because higher grade students are able to obtain jobs that are more flexible and less physically demanding. In contrast, early retirement may be a more attractive option for those with lower academic performance. In our data, lower high school GPA is associated with lower earnings, so the opportunity cost of claiming benefits is lower for this group.

This paper contributes to the growing literature demonstrating long-term health effects of early-life exposures. Consistent with recent evaluations of compulsory education laws in England and France, our findings indicate that public policies must improve student achievement in school rather than just school attendance to produce beneficial health effects.

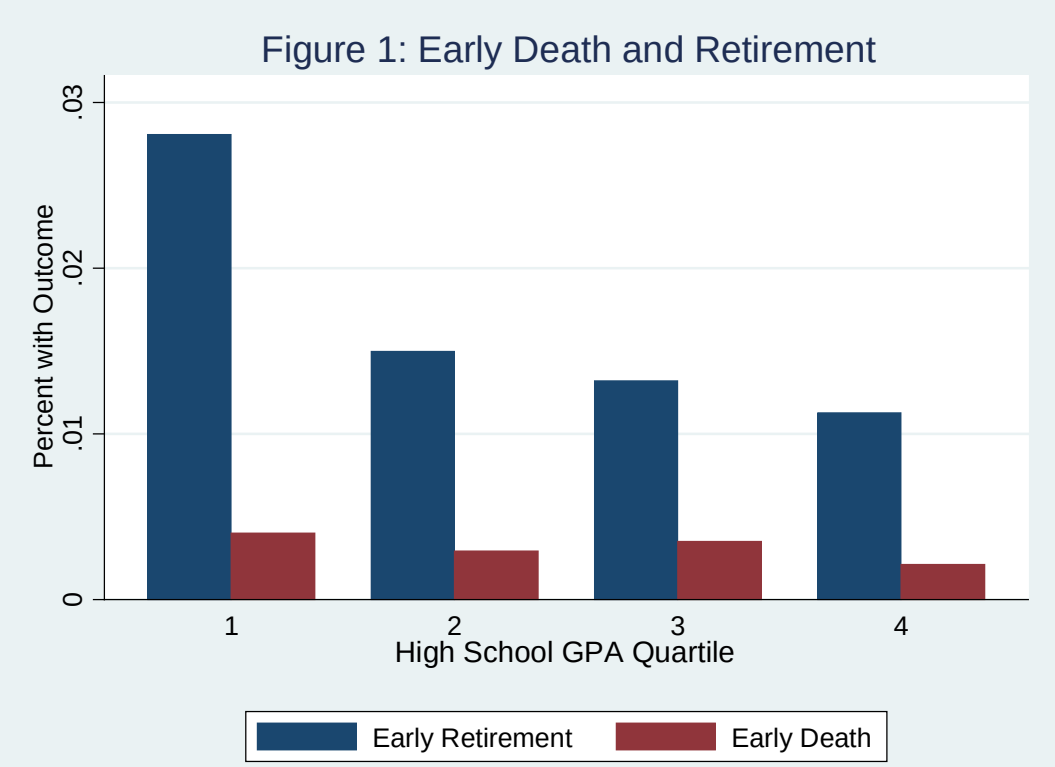

Table 1: Mother Fixed Effect Regressions, Students Classified by Quartile of HS GPA (relative to no HS)

	Died	Sick Allowance	Early Retirement	Died	Sick Allow	Early Ret
GPA lowest quartile	-0.004	-0.02	-0.026***	-0.004	-0.014	-0.026***
	(0.004)	(0.027)	(0.008)	(0.004)	(0.026)	(0.009)
GPA 2nd quartile	-0.003	-0.037	-0.035***	-0.003	-0.040*	-0.034***
	(0.004)	(0.023)	(0.008)	(0.004)	(0.024)	(0.008)
GPA 3rd Quartile	-0.003	-0.056**	-0.031***	-0.002	-0.059**	-0.031***
	(0.004)	(0.027)	(0.009)	(0.004)	(0.027)	(0.009)
GPA highest Quartile	-0.005	-0.052*	-0.036***	-0.004	-0.056**	-0.036***
	(0.004)	(0.027)	(0.009)	(0.004)	(0.028)	(0.009)
College	-0.001	-0.017	-0.009*	-0.001	-0.01	-0.009*
	(0.002)	(0.017)	(0.005)	(0.002)	(0.020)	(0.006)
Education Missing	0.007	0.026	0.113	0.007	0.029	0.113
	(0.054)	(0.123)	(0.165)	(0.054)	(0.123)	(0.165)
College*Low GPA				0.003	-0.055	0.002
				(0.007)	(0.051)	(0.013)
Fixed Effects	Mom	Mom	Mom	Mom	Mom	Mom
Cluster	Geo	Geo	Geo	Geo	Geo	Geo