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ABSTRACT

There is a large and robust correlation between adult health and education, part of which likely reflects causality running from education into health. Less clear is whether education obtained later in life is as valuable for health as are earlier years of schooling, or whether education raises health directly or through income or wealth. In this paper, I examine how the timing of educational attainment is important for adult health outcomes, income, and wealth, in order to illuminate these issues. Among military retirees, a subpopulation with large variation in the final level and timing of educational attainment, the health returns to a year of education are diminishing in age at acquisition, a pattern that is less pronounced for income and wealth. In the full sample, the marginal effects on the probability of fair or poor health at age 55 of a year of schooling acquired before, during, and after a roughly 25-year military career are –0.025, –0.016, and –0.006, revealing a decline of about half a percentage point each decade. These results suggest that education improves health outcomes more through fostering a lifelong accumulation of healthy behaviors and habits, and less through augmenting the flow of income or the stock of physical wealth.

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1 Introduction

The positive association between education and health or survivorship has been a subject of much scholarly interest since the work of Kitagawa and Hauser (1973).[1] There are plausible lines of causality running both ways. Education could produce good health directly by improving knowledge of healthy practices, or indirectly by raising socioeconomic status or wealth. Or good health early in the life cycle could facilitate both more education and better adult health. Other variables such as ability or time preferences could increase both health and education, and reality could easily be some combination of all of these pathways. Studies of exogenous variation in schooling are rare, but those that exist reveal a line of causality running from education to health outcomes (Adams, 2002; Oreopoulos, 2003; Lleras-Muney, 2005), at least at lower levels of attainment acquired at younger ages. Cutler and Lleras-Muney (2008) remark that less is known about the health effects of higher education, probably because natural experiments are more rare. They find in the cross section that the effect of education on many indicators of health appears to be roughly linear in years of school past the tenth, with no clear "sheepskin" effects of particular levels of degree attainment.

Individuals typically acquire primary and secondary education during adolescence, and compulsory schooling laws require some or all of it. But college and other higher education can often be acquired later in life. In certain countries and among particular subgroups, delayed postsecondary and higher education is even rather common. Gall, Legros and Newman (2006) illustrate how heterogeneity in the timing of education across the life cycle varies significantly across the OECD, with the narrowest distribution observed in Ireland and the widest in New Zealand, Norway, and Sweden.[2] They and Sjögren and Saez-Marti (2004) construct theoretical models of the timing of optimal human capital accumulation based on

[1] Grossman (2006) and Cutler and Lleras-Muney (2008) provide recent reviews of this extensive literature.

[2] Gall, Legros and Newman (2006) measure the years separating the 20th and 80th percentiles in the age at completing tertiary education. In Ireland, the gap is about 2 years; in the U.S., it is around 9 years; in New Zealand, Norway, and Sweden, the gap is 20 years.

the labor market returns associated with matching processes or confronting uncertainty in returns and the price of time. Without those forces, of course, education later in life appears suboptimal; in the traditional view of human capital (Becker, 1962; Mincer, 1974), education that maximizes lifetime returns occurs as early in life as possible. Empirical estimates of the labor market costs of delaying education broadly confirm this story, in the sense that "gap years" spent earning lower wages before acquiring education that raises wages are by definition costly. But whether the returns to additional years of education depend on when they were received during the life course is less clear, though it is the subject of much previous research.[3]

Given the interconnections between health, income, and education, it is a natural extension to ask how the timing of education may affect health. To my knowledge, no prior studies have attempted to do so explicitly. As is often the case in the literature on interruptions in education and earnings, the existing evidence derives from studies of military service. Building off the work of Card and Lemieux (2001), who find that draft avoidance raised attainment during the Vietnam War, Grimard and Parent (2007) find some evidence that avoidance may have resulted in reduced smoking and thus better health for nonveterans. This fits with recent work by Bedard and Deschênes (2006) that reveals higher mortality among U.S. birth cohorts with high military participation ostensibly due to smoking, which could be connected to delayed education.[4] Given evidence of the net stimulative impact of the midcentury G.I. Bill on the educational attainment of veterans (Bound, 2002; Stanley,

[3]Griliches and Mason (1972) examine a cross section of veterans in a 1964 Current Population Survey and find that returns to education acquired during or after military service were insignificantly higher than returns to education received before service. Griliches (1980) and Marcus (1984) both explore the returns to interrupted schooling in the National Longitudinal Survey (NLS) of Young Men between 1966 and 1973, and neither find a penalty for interruption. More recent studies that focus on exogenous variation in the incidence of military service reveal a zero net effect for the World War II cohort (Angrist and Krueger, 1994) but negative and persistent effects on earnings for later cohorts (Angrist, 1990, 1998; Imbens and van der Klaaw, 1995). Light (1995) reveals wage penalties for delayed education among white men in the 1979 NLSY that persist for four years and then die out. After broadening the NLSY sample to include women and minorities and adopting a different statistical model, Monks (1997) finds permanent wage penalties for delay. In Swedish data collected after 1985 on cohorts born before 1973, Holmlund, Liu and Skans (2008) reveal persistent and significant effects on earnings associated with short delays in entering college.

[4]Other research reveals considerably more ambiguity about the net impact of military service on health (London and Wilmoth, 2006; Dobkin and Shabani, 2009).

2003), it would appear that either delayed education is less valuable in terms of health, or the negative effect of military service on health is large enough to outweigh the benefit of increased education, or both are true. As of this writing, no study has examined the effect of the G.I. Bill on veterans' health, or the effect of delayed education on health more generally.[5]

In this paper I explore how the timing of education matters for health, income, and wealth among an interesting subpopulation of veterans. I examine a cross-sectional survey of military retirees that retrospectively asks about educational attainment at three stages of the life cycle. It also asks about current health as well as service-related disability, which measures a dimension of health prior to retirement. Military retirees are interesting for several reasons. Their lengthy service careers, typically 20 years or more, is evidence that their health and abilities during adolescence and young adult years must have met some baseline standard. Thus they ought to be subject to less unobserved heterogeneity in factors that affect health than the rest of the civilian population, which should help reduce bias. Military retirees also exhibit a very large amount of variation in the timing of education across the life cycle. A majority receive additional education during military service, and almost a third acquire more education after retiring with 20 years of service, typically after age 45.

My strategy is to compare correlations between current adult health and education history with correlations between current household income or wealth and education history. Data limitations currently preclude a more careful unraveling of the multiple lines of causality; instead, I check for robustness across selected subsamples. Result show that health returns to education appear to be strongly and monotonically diminishing in age at acquisition across broad stretches of the life cycle, which are measured in three parcels of roughly two decades

[5]The gap in the literature may be due to the apparent absence of a clean natural experiment vis-à-vis health in the context of military service. Even if drafted veterans ultimately acquire more education than nonveterans, as the literature on the G.I. Bill suggests they do, military service is likely to exert an independent effect on health through combat exposure and other channels. This would complicate any comparison of veterans to nonveterans. Differences across subgroups of veterans might be more interesting if they were subject to plausibly exogenous variation in the determinants of education. Another direction would be to focus on differences in the timing of education and health across all civilians, extending the findings of Light (1995) and others to health.

each. By contrast, there appear to be no vintage effects of education on home ownership, and the marginal effects of education on income decline only post-service and not before. These results suggest that the effect of education on later-life health is channeled through the lifelong accumulation of stocks, such as knowledge of healthy practices or human capital and health earlier in life, and not via increases in income or wealth achieved later in life.

In the sections that follow, I first describe the dataset and what it reveals about the life cycle of education among military retirees compared to that of civilians, which has been more broadly studied. Then I discuss a theoretical framework for thinking about health, education, and military service over the life course, and I address the special characteristics of veterans that are important for understanding patterns in their education timing and health. The theoretical framework suggests several regression equations that allow me to test hypotheses about the relationships between education timing and health, and between health, income, and wealth. The next section presents and briefly discusses the results, and the final section discusses their implications and some directions for future research.

2 The life cycle of schooling among military retirees

Figure 1 depicts the special timing of education across the life cycle among military retirees. The data are drawn from the 2003 Survey of Retired Military (SRM), which asked retirees to retrospectively report their levels of educational attainment when they entered the military, when they retired, and at the time of survey.[6] MacLean and Edwards (2009) describe the dataset in greater detail. Figure 1 plots education trajectories across age for all male retirees

[6]The 2003 SRM is a snapshot of approximately 30,000 veterans, of which 16,155 are men aged 40 or over with 20 or more years of active duty and a complete set of covariates. As I explain in the notes to Table 1, I dropped 264 individuals with full covariates who reported losing educational attainment between life stages. Responses are categories rather than years of attainment, so I translate between them using the following scheme. Less than 12 years is probably age 16 or 10th grade. A GED or high school equivalency and high school diploma are 12 years. Less than 2 years of college without a degree is 13 years. A 2-year college degree is 14 years. More than 2 years of college credits but no 4-year degree is 15 years. A 4-year college degree is 16 years. Some graduate school but no graduate degree is 17 years. A master's, doctoral, or professional degree is 20 years. An earlier survey in 1996 asks similar questions, but the public version of the 1996 SRM reports age only in two broad groupings, under or over 65, so I focus on the 2003 survey because it measures single years of age.

aged 40 and older with 20 years of active duty service, and also plots separate trajectories for officers and enlisted men. On average, military retirees entered service at age 20 with 12.8 years of school, left service at age 43 with 15.2 years, and reported 15.8 years of schooling at survey, aged 57. As shown in the graph, this pattern of delayed attainment varies somewhat by rank. Officers entered service two years later with 14.6 years of education compared to 11.9 among enlisted men; they gained 3.4 years of education during service as opposed to 1.8; and they received an additional 0.4 year rather than 0.8 year after retirement. For enlisted men, the trajectory is almost linear, while it is concave but still strictly increasing for officers.

The pattern of significant delay among retirees of both ranks contrasts with patterns of educational timing among members of a typical U.S. civilian cohort, who tend to complete their education much earlier in life. Figure 2 shows the trajectory of average education by age among members of the NLSY79 cohort, which decelerates after the mid-twenties. The slope is about 0.85 prior to age 20, 0.34 between 18 and 22, and about 0.03 after age 22. By comparison, the slopes in Figure 1 hover between 0.05 and 0.15.

Absolute levels of attainment in these two graphs are also revealing. With about 11.9 years of education by age 20 and 13.7 by age 42, enlisted retirees are very similar to the civilians in the NLSY79 cohort in terms of their trajectories prior to retirement. But the additional 0.8 year they acquire by age 55 is unique. Retired officers have much higher levels of education than either group, and their rate of acquisition during military service is uncommonly rapid for that age.

Table 1 reports more characteristics of the regression sample, stratified by final rank and by VA disability status.[7] As shown across the columns, the timing and level of educational attainment varies with rank but not as much with disability. This is consistent with similar patterns in VA disability prevalence and level across officers and enlisted men. More than three quarters of all retirees report acquiring additional education during their military

[7]The SRM contains self-reports of VA disability ratings as well as administrative data on actual ratings derived from official VA records. The two measures are similar in the data, but I rely on the latter.

careers. Nearly a third acquired more education after retirement, with greater prevalence among enlisted men and to a lesser extent disabled retirees.

The lower rows in Table 1 reveal that rank is correlated with current health and socioeconomic status (SES), while disability status is strongly correlated with health and somewhat with SES. Compared to enlisted men, retired officers are roughly half as likely to report fair or poor health, they earn 75 to 80 percent more income, and they are 10 percent more likely to own their own home. Non-disabled retirees are only 30 percent as likely as disabled veterans to be in fair or poor health, and they earn 10 to 13 percent more income, but their homeownership is actually slightly lower. Part of these SES patterns may reflect race and ethnicity; African Americans and Hispanics are disproportionately enlisted and VA disabled.

Compared to national data, Table 1 also implies that this subpopulation of military retirees is relatively unhealthy, but this may be explained by the prevalence of combat-related disability. Data from the 2003 National Health Interview Survey show 15.8 percent of males over 40 report fair or poor health, compared with 18.1 percent of male veterans over 40. Both figures are considerably lower than the 27.6 percent of male military retirees over 40 who report fair or poor health as shown in the first column of Table 1.[8] But as revealed in the fourth column, only 11.6 percent of retirees without a VA disability rating report fair or poor health. The picture that emerges is of military retirees as a select group compared to all civilians, with higher education and better health in older age in the absence of combat-related disability, possibly due to better initial health. One interpretation of these patterns is that military service reduces health through combat exposure, at least among professional soldiers. This is a different perspective than suggested by Bedard and Deschênes (2006), who find that cigarette smoking rather than combat exposure explains the negative health effects of military service. But they consider the broader group of all veterans, not just military retirees.

[8]The application of survey weights does not appreciably change the proportions in Table 1.

3 Theoretical considerations

In this section, I explore theoretical explanations for patterns of delayed schooling, discuss relevant characteristics of veterans and their budget constraints, and I motivate testable regression equations within a health capital framework. The underlying questions I seek to address are whether delays in schooling affect health, income, and wealth; and if they do, whether those patterns reveal new information about the pathways through which education affects health.

3.1 A simple model of endogenous education timing

While being drafted is not a choice, completing a military career and becoming a military retiree are choices, however constrained they may be. Thus it is natural to think of the timing of education among military retirees as more or less endogenous, if relatively unique to their situations. As reviewed by Grossman (2006), the theoretical literature on health capital typically treats education as an exogenous variable that augments health production. There are notable exceptions; Fuchs (1982) argues that time preference is a third variable that causes both education and health, while Becker and Mulligan (1997) offer support for essentially the reverse view, that education and health can cause time preference. Later-life schooling among military retirees could be consistent with Fuchs's view if military service is a treatment that produces a lower discount rate. But human capital theory can also produce staggered timing through more straightforward channels, which I now discuss.

A closely related topic in labor economics concerns the extent to which omitted variables like ability may cause both education and earnings, in other words, how education can be endogenous. Building on earlier work by Becker (1967), Card (2001) provides an overview of this work and develops a model with an endogenous amount of schooling. Card's model allows and produces heterogeneity in the duration of schooling but not its timing, presumably because the latter is relatively rare among the U.S. civilian population as a whole.[9] In the

[9]Card and Lemieux (2000) find that only a quarter of the NLSY cohort interrupted schooling but later

appendix, I present a straightforward extension of Card's model that produces endogenous education timing, and I summarize the main insights here.

Optimizing individuals without liquidity constraints will equate the marginal costs and marginal benefits of delaying education. In so doing, they compare the labor market returns in terms of income $y(\cdot)$ to schooling S at time t, $\partial y(S,t)/\partial S$, net of the cost of tuition, $T(t)$, and any utility costs of attending school, $\phi(t)$, with the real interest rate, r. Broadly speaking, delay will not be optimal when the net returns to schooling exceed the real interest rate, and it may never be optimal.

Patterns in completed schooling and its timing among military retirees suggest there is heterogeneity in at least one component of marginal costs and benefits, which include

1. The returns to schooling, $\partial y(S,t)/\partial S$; lower returns prompt delay.

2. Net tuition costs, $T(t)$; higher tuition prompts delay.

3. Utility costs of schooling, $\phi(t)$; higher costs prompt delay.

Delay of schooling could either be temporary or permanent depending on how each of these evolves over time. Permanently higher tuition costs could produce a permanent delay of schooling and permanently lower attainment, while temporarily higher tuition costs result in a temporary delay.

Card (2001) argues that the evidence on returns to years of education indicates a smaller role for heterogeneity in source 1, which comprises the economic benefits of education, or "ability," and a larger role for sources 2 and 3, the differences in the marginal costs of schooling. This is because instrumental variables estimates of the returns to education, which tend to derive from policy-driven extensions of schooling into underserved subgroups who might have low ability, tend to be at least as large as OLS estimates. Whether source 1 is also relatively unimportant for the timing of schooling seems plausible but is less clear.

returned, and more than half of the returners complete a semester or less. These figures are similar to but slightly below those reported by Light (1995), who examines the 800 returners out of the 2,489 white men in the NLSY.

The returns to schooling may be very different across individuals of different ages even if the evidence suggests they are the same within a particular age range.

3.2 Military service and education timing

Compared to nonveterans, military retirees are unambiguously more likely to delay education because of relatively generous post-service education subsidies, which affect marginal costs via source 2. According to the 2008 Green Book, the maximum full-time enrollment benefit that year under the Montgomery G.I. Bill (Chapter 31) was $1,101 per month over 36 months, or about $10,000 per nine-month academic year, for veterans who had served at least three years. This is a very large subsidy; current estimates of average educational expenses from the National Center for Education Statistics are between $12,000 and $16,000 depending on the type of degree and whether room and board are included. The new Post-9/11 G.I. Bill (Chapter 33) is even more generous, offering up to full funding of a four-year college degree for veterans with three years of active duty service. Veterans with a service-related disability rating of at least 20 percent also qualify for vocational rehabilitation and employment benefits, which can cover college or vocational training.

It is also conceivable that sources 1 or 3, the returns to education or the utility costs of schooling, could be different for veterans than for civilians, either in level, trend, or both. In an all-volunteer force, service members are likely to be a select group with special characteristics that led them to enlist rather than obtain more education.

Liquidity constraints could also be important for education timing and for veterans in particular. If borrowing against future earnings is unavailable, individuals with low wealth would be more likely to delay education, possibly entering military service as an alternative or in order to gain education subsidies.

One of the most important characteristics of a service member is his or her rank, which is strongly correlated with a variety of life outcomes including adult health (MacLean, 2008; MacLean and Edwards, 2009). Rank also interacts with education; enlisted men typically

must have completed a high school degree, while commissioned officers must have earned a college degree. And as Table 1 shows, the timing of schooling acquisition is somewhat different for officers versus enlisted men. Retired officers started with more education and gained it faster, but by the time of survey, enlisted men have narrowed the initial gap. Because rank could proxy ability, I pay special attention to it in my empirical analysis.

3.3 Health and education timing

Health capital could appear either as another argument in the utility function (Picone, Uribe and Wilson, 1998), a factor influencing the time horizon in a "pure investment" model (Grossman, 1972), or as both (Ehrlich and Chuma, 1990). I make no attempt here to formally model the relationship between health and education timing, because I do not believe it would reveal any insights that are testable in the public SRM data. Instead, I outline how an analogous model with health would be similar to the appendix model, I propose some testable hypotheses, and in the next subsection I specify regression equations based on budget constraints in a model of health capital.

As reviewed by Grossman (2006), uncertainty remains about the pathways, but education plausibly raises health either through raising the value of any particular health investments, or enhancing "productive efficiency" per Grossman (1972) and others, or by raising the overall frequency of health investments or healthy behaviors given fixed budgets, enhancing "allocative efficiency." If earnings are not held constant, of course, education could also raise health by raising earnings. Whatever the precise channel involved, the full marginal benefits of schooling should be higher for everyone once one accounts for health, other things equal.

As is true with labor market returns to education, it is conceivable that the shape of the health production function through education varies across individuals. If true, low health returns could be an additional reason for an individual to delay or forgo education. But Grossman (2006) reports that most IV estimates of the effect of education on mortality or health, such as obtained through expansions of compulsory schooling, are larger than OLS

estimates. Following the logic of Card (2001), this suggests that the marginal health benefits of schooling may not vary systematically due to ability bias; rather, the marginal costs of schooling are likely to be more important.

This reasoning naturally leads to some testable if tentative hypotheses about the relationship between delayed education and stocks and flows of health and wealth. If the marginal benefits to schooling are indeed fairly static across individuals *and across age*, we would expect to find that those with a certain final level of educational attainment should enjoy the same flow of health investments or income regardless of whether they ever delayed schooling. This is basically consistent with the results of Light (1995), which suggest that earnings eventually rebound after gap years, but not with all findings in the literature on gap years and wages. In contrast, one would expect that stock variables like health and wealth should be permanently lower among observationally equivalent individuals who delayed their education. This is because their health investments and incomes must have been lower during the delay. Needless to say, for significantly delayed education such as the gaps of several decades among military retirees, a key unknown is how the marginal benefits of schooling may vary across age. This reasoning assumes they do not, but it is equally plausible that age could either impede or improve learning.

A second set of hypotheses concerns the relative as opposed to the absolute associations between schooling vintages, health, wealth, and income, which are motivated by our interest in untangling the relationships between all of these correlated variables. If education of a particular vintage affects one flow or stock variable but not the other, or if the trajectory of marginal effects is significantly different, such patterns reveal information about the pathways through which education affects health. For example, later-life education may raise income and wealth but not health, suggesting that education raises health through lifelong accumulation of knowledge about healthy behaviors rather than by raising wealth or income.

3.4 A testable regression model

To formally explore the empirical effects of delayed education on health, it is useful to examine budget constraints in a discrete-time model of health capital. Assume individuals maximize utility subject to three "flow" budget constraints that describe the dynamics of stocks of health H_t and wealth W_t, and the flow of income y_t:

$$\begin{aligned} H_t &= (1-\delta)H_{t-1} + h(m_t, S_t) + \epsilon_t^H && (1) \\ \log y_t &= f(H_t, S_t) + \epsilon_t^Y && (2) \\ W_t &= (1+r)W_{t-1} + y_t - c_t - p_t \cdot m_t - T_t \cdot \Delta S_t + \epsilon_t^W && (3) \end{aligned}$$

Years of schooling acquired as of time t is S_t; δ is the rate at which health depreciates; health production $h(\cdot)$ depends on medical spending m_t and schooling S_t, whose prices are p_t and T_t; c_t is other consumption; r is the real interest rate; labor is supplied inelastically and normalized to 1, and wages $f(\cdot)$ are a function of health and schooling; and the ϵ's are white-noise errors.

With information on the timing of schooling over the life cycle, I can rewrite these equations to test for vintage effects. As shown by Table 1, the SRM contains measures of retirees' stocks of education at entering the military, at leaving the military, and at survey, which roughly correspond to ages 20, 45, and 55. The stock of education at survey can be additively decomposed:

$$\begin{aligned} S_{55} &= S_{20} + (S_{45} - S_{20}) + (S_{55} - S_{45}) \\ &= S_{20} + \Delta S_{45} + \Delta S_{55}. && (4) \end{aligned}$$

Using equation (4) and some simplifying assumptions, I can rewrite the structural budget constraints as estimable regression equations of health, wealth, and income at the time of survey at age 55. I posit the health production function $h(\cdot)$ is linear in its arguments, and I

assume a Mincerian log earnings function $f(\cdot)$ that is as well. I must omit medical spending because it is not observed in the SRM. After inserting a vector controlling for observable characteristics at survey, X_{55}, I estimate these versions of the structural budget equations:

$$H_{55} = \alpha^H + \beta^H H_{45} + \eta^H_{20} S_{20} + \eta^H_{45} \Delta S_{45} + \eta^H_{55} \Delta S_{55} + \theta^H \log y_{55} + \gamma^H \cdot X_{55} + \epsilon^H_t \quad (5)$$

$$\log y_{55} = \alpha^y + \beta^y H_{55} + \eta^y_{20} S_{20} + \eta^y_{45} \Delta S_{45} + \eta^y_{55} \Delta S_{55} + \gamma^y \cdot X_{55} + \epsilon^y_t. \quad (6)$$

$$W_{55} = \alpha^W + \beta^W H_{55} + \eta^W_{20} S_{20} + \eta^W_{45} \Delta S_{45} + \eta^W_{55} \Delta S_{55} + \theta^W \log y_{55} + \gamma^W \cdot X_{55} + \epsilon^W_t \quad (7)$$

Health depends on past health, education, current income, and other characteristics; income depends on current health, education, and other characteristics; and wealth depends on current health, education, current income, and other characteristics.

Endogeneity is readily apparent in this system, and instrumental variables or some other approach would be necessary to fully address it. The public version of the 2003 SRM includes no geographic identifiers and no good instruments, so I focus on OLS results in this paper. What is interesting is how the η's, the coefficients on schooling, change by vintage over the life course, how their trajectories vary across equations (5), (6), and (7), and how they compare to coefficients on total education ever attained. If the η^H's fall faster with age than the η^y's, for example, the implication is that education affects health through the lifelong acquisition of protective stocks that accumulate slowly, like knowledge and patterns of healthy behavior, rather than through the impact of education on income.

4 Data and results

As shown in Table 1, the health metrics in the 2003 SRM include self-reported health status on a five-point Likert scale, two questions about health-related work limitations, and several indicators of functional limitations or disability. For each of these, I generate binary indicators of bad health and model H_{55} in the health equation (5) with a logit. Results are ex-

pressed as marginal effects in order to enhance comparability with Cutler and Lleras-Muney (2008). Earnings and household income are both measured with high granular detail and minimal topcoding. To estimate the income equation (6), I model the log of each measure using OLS. The only measure of wealth available to estimate equation (7) is an indicator of whether the retiree owns or rents his own home, which I model using a logit.

The vector of characteristics observed in the SRM, X_{55}, includes an indicator variable for officer status, age, race, ethnicity, and marital status. I use VA disability rating as an indicator of health at 45, H_{45}. As in Table 1, I restrict my estimation sample to include men over 40 with at least 20 years on active duty. To help address selection problems, I first estimate the models on the entire sample and then separately across important subgroups.

4.1 Full sample

Each row in Table 2 displays estimates of the education coefficients, η_{20}, η_{45}, and η_{55}, from a separate health, income, or wealth regression. The first nine rows report the marginal effects of schooling by vintage on the probability of each health condition measured in the data, the following two rows reveal the marginal effects of schooling on log earnings and log household income, and the last row shows the marginal effects of schooling on the probability of homeownership. The last column in each row depicts the marginal effect of total years of education from a separate regression in which vintage effects are constrained to be zero, which is the standard specification in the literature.

The first row in Table 2 reveals that earlier years of education are significantly more protective against self-reported fair or poor health than are later years. The marginal effect of education at entering the military is -0.0254 and significant at the 1 percent level; the coefficient on education earned after entering but before retirement is -0.0161 or about a third smaller but still highly significant; and the coefficient on post-retirement education is only -0.0059 and significant at the 5 percent level. The last coefficient is about one third the size of the constrained marginal effect associated with total years of education at survey,

−0.0158, which is shown in the last column of the first row. By comparison, Cutler and Lleras-Muney (2008) report marginal effects of total years of education on self-reported fair or poor health ranging from −0.0073 to −0.0152 depending on the number of controls.

A similar pattern emerges in the following 8 rows. For most of these health indicators, years of education acquired during service are protective against the dimensions of bad health in Table 2, but in each case they are also significantly less protective than years acquired before service. Education acquired after service appears to be practically meaningless for these measures of bad health. As shown in the last column, total years of education are protective against all these conditions except difficulty hearing, but only in the case of difficulty seeing is the marginal effect of post-service education negative and significant. It is unlikely that power is an issue here; as shown in Table 1, these health conditions are generally as prevalent as self-reported fair or poor health.

Patterns in the bottom three rows reveal a different relationship between education vintage and SES outcomes. Earnings rise 5.5 percent with each year of education prior to service, then rise 5.8 percent with each year acquired during service, but they do not respond significantly to years acquired after service. Household income rises 6.4 percent with education prior to service, 6.1 percent with education during service, but only 2.7 percent with post-service education, all significant at the 1 percent level. For both definitions of income, the reduction of more than half in the marginal effect of education after retirement is highly significant, but there is no significant difference between education acquired prior to service versus during service. The divergence in results, namely how post-service education affects household income but not labor earnings, reflects the sensitivity to post-service education of the respondent's income from assets, pensions, and transfers, and of the spouse's income.[10]

[10]There are four components of individual income in the 2003 SRM: labor earnings, asset income, pension income, and transfers. Household income is the sum of these across respondent and spouse. The respondent's transfer payments are individually the most sensitive to post-service education, but excluding them does not change the qualitative result. Transfer income in the 2003 SRM includes all of the following as a single item: supplemental security income, unemployment insurance, civilian or military disability, worker's compensation, the G.I. Bill, food stamps, Aid to Families with Dependent Children (AFDC) or welfare, and

The last row in Table 2 shows that the probability of home ownership responds equally to education across all vintages including post-service. Although there is a slight decline in marginal effects with age, the differences are not statistically significant. Each additional year of education raises the probability of home ownership by about 0.6 percentage point.

4.2 Subsamples across rank and disability

As Table 1 shows, there are sometimes large differences across these groups in health, education, and SES, which raises the concern that selection could be important. Indeed, one way of interpreting rank is that it proxies ability. VA disability is partially compensated with educational subsidies. In Table 3A, I reestimate equations (5), (6) and (7) on subsamples defined first by rank and then by VA disability status. Among each subsample, I model self-reported fair or poor health, log household income, and home ownership.

The top panel examines differences between officers and enlisted men. For both groups, the health effects of education fall strongly with age. This is more pronounced among enlisted men, for whom the marginal effects fall by half from -0.0381 to -0.0194, both highly significant, and then by a third to -0.0070, significant only at the 10 percent level. By contrast, income and wealth effects of education are stable prior to retirement for both groups, while post-service education matters only for the income and housing of enlisted men. As in Table 2, the effect of post-service education on income is only about half the size of effects prior to retirement for enlisted men, while it is insignificant for officers. If ability bias were driving the downward-sloping vintage effects of education, one would expect them to vanish or at least lessen when the sample was constrained to the group with higher ability, namely officers. Here we find no such evidence.

In the bottom panel of Table 3A, groups stratified by VA disability exhibit similar patterns. The chief differences from the top panel are that both disability groups benefit from post-service education in terms of income and home ownership, and retirees without a VA

child support or alimony. The components of spousal income that vary significantly with the respondent's post-service education are labor and pension income.

disability experience health benefits. But among both groups, there are significant vintage effects of schooling on health earlier in the life cycle, while vintage effects of schooling on income are only important post-service. There is limited evidence of any vintage effects on home ownership; there is a larger effect of pre-service education for the non-disabled. It is interesting that marginal effect of education on health stays the same during and after service for retirees with no VA disability, while it falls for disabled retirees. In isolation, this result might suggest a role for VA disability in producing downward-sloping marginal effects. But we still see a reduction in the marginal effect among the non-disabled group after entering the military. Thus vintage effects of education on health appear not to be concentrated among the disabled.

4.3 Subsamples of returning students

There may be variables other than rank and disability status that are correlated with patterns of schooling, although those two are likely to be the main determinants. Another feasible strategy to address selection is to reestimate the models among subgroups that have either returned for additional education or not. Such a technique draws identification from differing treatment intensity among the treated. As shown in panels A and B of Figure 3, there is considerable variation in the amount of extra education earned among both subgroups of returning students, those who acquired additional education during service (panel A), and those who acquired more post-service (panel B). If the determinants of reentering school differ from the determinants of how much schooling to receive upon having returned, then this approach will help address the problem of endogeneity in the decision to return.

The top panel in Table 3B explores how vintage effects of education may depend on whether the retiree returned for post-service education. As in Table 3A, the levels of the estimates change somewhat, but few qualitative differences from the baseline results in Table 2 are apparent, which suggests they were fairly robust to this form of selection. Both post-service returners and non-returners experience significantly reduced marginal effects on

health of education received during service, −0.0267 and −0.0134, compared to that received before, −0.0469 and −0.0204. In both cases, the marginal effects fell by about 40 percent over roughly 25 years. For post-service returners, the marginal effect on health of post-service schooling is similar in magnitude to that in Table 2, but it is insignificant. Both groups consistently benefit from schooling prior to retirement in terms of income, and marginal effects on home ownership are stable if also insignificant in the case of returners. Those who obtain education post-service benefit from it in terms of income, but the marginal effect is again significantly lower than for earlier vintages of education, much as in Table 1.

The bottom panel of Table 3B presents estimates among groups defined by whether they obtained education during service. Patterns that are now familiar reemerge. Vintage effects of education are clear and large in the health regressions, while in the income regressions there is no significant vintage effect until post-service. Pre-service education matters twice as much for home ownership than later education among those who acquired more education during service. This pattern is also found among non-disabled retirees, as shown in the lower panel of Table 3A, but its meaning is unclear.

5 Discussion

Military retirees are a unique group with considerable heterogeneity in the timing of their education across the life course, and in their SES and health following their retirement from the military. Although not all results will directly generalize to civilian populations, this group is worth studying because their special characteristics have the potential to reveal new insights about the dynamics of health, SES, and education over the life course.

The primary contribution of this study is to show that the health returns to education appear to be strongly and monotonically diminishing in the age at acquisition. For the full subsample from the 2003 Survey of Retired Military, the marginal effect on the probability of self-reported fair or poor health of an additional year of education acquired before military

service begins, around age 20, is −0.025. It diminishes to −0.016 for education acquired during service, usually up to about age 45, and then to −0.006 for education acquired after retirement and by the time of survey, around age 55. Based on the midpoints of these age ranges, this trajectory represents an average rate of decline of about 0.5 percentage point each decade. Similar patterns emerge for the other measures of bad health in the 2003 SRM. For many of these, which focus on functional limitations, education acquired post-service has no significant effect at all, while education during service remains significantly protective, but less so than pre-service education.

In contrast, the vintage effects of education on income and wealth are quite different. The marginal effects of education acquired before or during military service on income are roughly constant at about 0.06. But the marginal effect of post-service education on labor earnings is insignificant, while the marginal effect on household income falls by half to 0.03. Meanwhile, marginal effects on the probability of home ownership tend to be constant across educational vintage at about 0.06. This last result is particularly striking because unlike income, wealth is a stock like health, which should display permanent effects of temporarily lower inflows. That health is permanently lowered by delayed education while wealth is not would be a provocative finding. But home ownership is a poor measure of the stock of wealth; the dollar value of housing or other assets would be far preferable but is unavailable in the 2003 SRM.

Indeed, data limitations temper many of these results. There may be unobservable characteristics and selection issues that could bias the basic OLS results. This study draws identification only from cross-sectional and longitudinal statistical patterns, and not from any natural experiment. But results are robust across a broad array of subsamples that cut along the lines most likely to be important for selection. Patterns are broadly similar for officers and for enlisted men, which suggests that unobserved ability bias may not be important. Among retirees without a VA disability, the marginal effect of education on health does not fall again after retirement, but it is already half as large as it was prior to service. Retirees with VA disabilities, the majority of the sample, experience larger drops in

the protective effects of post-service education but consistent declines through life. The age trajectory of marginal effects is also strongly declining within subgroups that choose to seek more education. In all of these cases, the marginal effects of education on health decline monotonically with age, while the effects on income and wealth either remain stable or stay constant before declining only post-service.

The similarity of such patterns across many subgroups is reminiscent of the finding within labor economics that the marginal benefits to earnings of education may not vary substantially across individuals, or with ability (Card, 2001). It is also somewhat consistent with related results on the response of health outcomes to policy-driven shocks in educational attainment (Adams, 2002; Lleras-Muney, 2005). In these literatures, the similar size of OLS and IV estimates of the marginal effect of schooling — the latter often are larger than the former — suggest that marginal benefits may either be similar across subgroups or may vary inversely with ability, and that variation in marginal costs better explains heterogeneity in attainment. Here, there appears to be some variation across subgroups in the marginal benefits of education of a particular vintage, at least in health if not in income or home ownership. But the age trajectories of these marginal benefits are very similar across all subgroups.

It is striking that the wage premium on education should remain relatively constant across vintage while the health premium monotonically declines with age. The stability of the marginal effect of education on home ownership suggests further that the pathways linking education, health, and SES over the life course are neither simple nor static. Thus the second main contribution of this study is to provide some new insight into the relationships between these factors.

An obvious channel through which education could affect health is by raising income and wealth, both of which are protective. But if that were an important channel, education that earns a particular amount of income or wealth should enhance health exactly the same regardless of when the education was acquired. The basic result here, that both early and

later-life education are interchangeably important for income and wealth, while early-life education is much more valuable for health, is not supportive of this perspective. Rather, it is more consistent with the results of Adams et al. (2003), who find that at older ages, causality runs more from health into wealth rather than the reverse. Later-life education may bring financial reward, but by then the die has been cast in terms of health.

On the basis of these findings, it would appear that education affects adult health through a much longer, possibly lifelong, process of building up healthy stocks, whether it is knowledge of healthy behaviors, an understanding and respect of scientific and medical opinion, or something else. This is entirely consistent with the concept of health capital (Grossman, 1972), but it also suggests that the depreciation of health or healthy knowledge must be small relative to the flow of new health investments, since new education presumably changes the latter immediately.

It is unclear whether these results generalize to a broader setting or are relatively specific to military retirees, a special group that frequently engages in later-life education, which is otherwise rare in the U.S. Given more widespread dispersion in the timing of education in other OECD countries (Gall, Legros and Newman, 2006), a fruitful next step may be to examine foreign datasets. But these results also suggest it is worthwhile to examine health dynamics and education timing in richer U.S. panel data such as the NLSY, PSID, and HRS, whenever education timing can be measured.

Appendix: A model of endogenous education timing

For simplicity, imagine schooling can be delayed indefinitely, but that once begun, it must be completed in full.[11] Let ρ be the time discount rate, $s \geq 0$ the endogenous starting date of schooling, S the duration of schooling in years, $u(c(t))$ the enjoyment of consumption, and $\phi(t)$ the utility cost of attending school. Then the individual's problem is to

$$\max_{c(t),s,S} \int_0^\infty u(c(t))\ e^{-\rho t}\ dt - \int_s^{s+S} \phi(t)\ e^{-\rho t}\ dt \tag{8}$$

subject to

$$\int_0^\infty c(t)\ e^{-rt}\ dt = \int_0^s y(0,t)\ e^{-rt}\ dt + \int_s^{s+S} [p(t) - T(t)]\ e^{-rt}\ dt + \int_{s+S}^\infty y(S,t)\ e^{-rt}\ dt, \tag{9}$$

where r is the interest rate, $y(S,t)$ is the full-time wage, $p(t)$ is the part-time wage earned while in school, and $T(t)$ is the cost of tuition. Card's model is the special case of $s = 0$. Here, the first-order condition with respect to S, the total years of acquired schooling, is

$$\lambda e^{-r(s+S)} [MB(S) - MC(S)] = 0, \tag{10}$$

where λ is the shadow price of wealth, and

$$MB(S) = \int_0^\infty \frac{\partial y(S, s+S+t)}{\partial S}\ e^{-rt}\ dt \tag{11}$$

and

$$MC(S) = \ y(S, s+S) - p(s+S) + T(s+S) + \frac{1}{\lambda}\ e^{-(\rho-r)(s+S)}\ \phi(s+S) \tag{12}$$

[11] In reality, schooling investments can also be lumpy. A more realistic model would allow for discrete chunks of schooling, but the same properties of time-dependent marginal costs relative to marginal benefits that are important here would still end up driving results. In addition, any fixed costs of starting or stopping education could also become important. Qualitatively, that story is similar to the one illustrated by this simpler model.

are the marginal benefit and marginal cost of the Sth year of schooling expressed in period-$(s+S)$ dollars. These equations differ from Card's only insofar as they also depend on the endogenous starting date, s.

When s is endogenous, the first-order condition with respect to s is revealing:

$$\lambda e^{-rs}\left[MB(s) - MC(s)\right] = 0, \tag{13}$$

where $MB(s)$ and $MC(s)$ are the marginal benefits and marginal costs associated with an increase in s. The marginal benefit of increasing s and thus delaying education includes earning $y(0,s)$ and avoiding the costs of tuition $T(s)$ and utility $\phi(s)$ today, and earning $p(s+S)$ in the future:

$$MB(s) = y(0,s) + T(s) + \frac{1}{\lambda}e^{-(\rho-r)s}\ \phi(s) + p(s+S)\ e^{-rS}. \tag{14}$$

The marginal cost comprises foregone part-time earnings $p(s)$, foregone full-time earnings $y(S, s+S)$, and the delayed tuition and utility costs:

$$MC(s) = p(s) + y(S,s+S)\ e^{-rS} + T(s+S)\ e^{-rS} + \frac{1}{\lambda}e^{-(\rho-r)(s+S)}\ \phi(s+S). \tag{15}$$

An interior solution requires that marginal costs rise faster than marginal benefits and that the schedules actually cross.

Subtracting equation (14) from (15) reveals that the costs of delaying education exceed the benefits when

$$\begin{aligned} MC(s) - MB(s) \;=\;& p(s) - p(s+S)\ e^{-rS} \\ &+ y(S,s+S)\ e^{-rS} - y(0,s) \\ &+ T(s+S)\ e^{-rS} - T(s) \\ &+ \frac{1}{\lambda}e^{-(\rho-r)s}\left[e^{-(\rho-r)S}\phi(s+S) - \phi(s)\right] > 0. \end{aligned} \tag{16}$$

Marginal costs can exceed marginal benefits when either the part-time wage $p(t)$ grows slower than the interest rate, or when either the return to schooling, $\partial y/\partial S$, or tuition $T(t)$, or the utility cost of attending $\phi(t)$ grows faster than the interest rate. Other things equal, any of these scenarios prompts the individual to move schooling forward in time by reducing s. For the special case in which $p(t)$, $T(t)$, and $\phi(t)$ are all always zero, this condition reduces to the familiar comparison of whether the return to schooling exceeds the real interest rate (Willis, 1986; Card, 2001).

For the average individuals who is not liquidity constrained, empirical estimates of the budget parameters in equation (16) suggest that the marginal costs of delay may easily exceed the marginal benefits globally. The real interest rate r is around 3 percent, while growth in real wages averages about 2 percent. The returns to a year of schooling are perhaps 10 percent (Card, 2001), considerably higher than r. According to official statistics, real costs of tuition, room, and board $T(s)$ are rising at about 2.5 percent, but for tuition alone the figure is more like 6 percent (U.S. Department of Education, 2009). These figures suggest many individuals may locate at a corner solution, $s = 0$. But the behavior of utility costs over time or age is less clear. If learning becomes more difficult with age, one would expect that $\phi' > 0$, and the individual might prefer a small s. But if age confers discipline and patience, those might lower ϕ and thus reduce the costs of delaying education because $\phi' < 0$.

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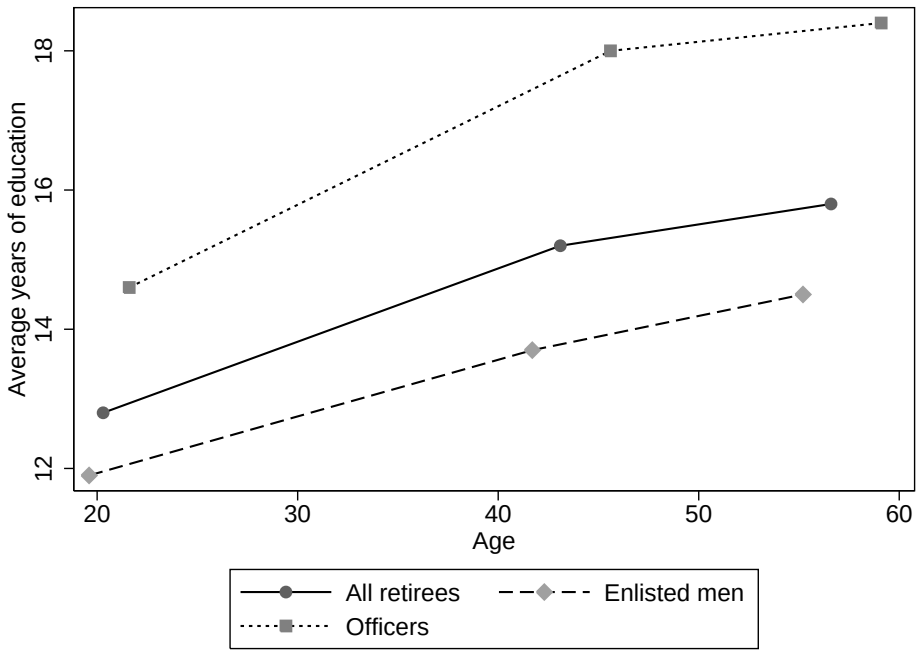
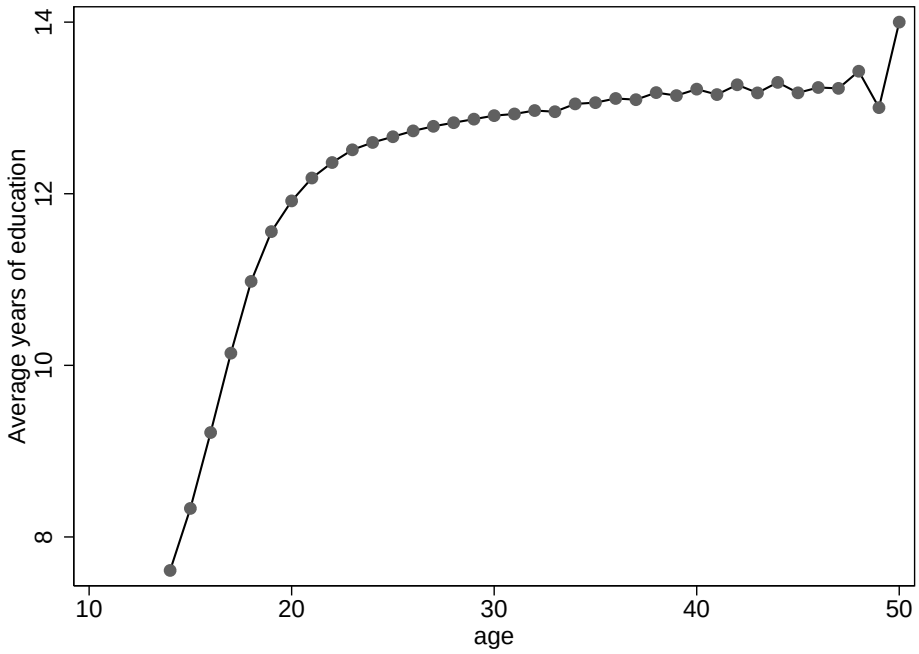
Figure 1: Average education among military retirees by age and rank



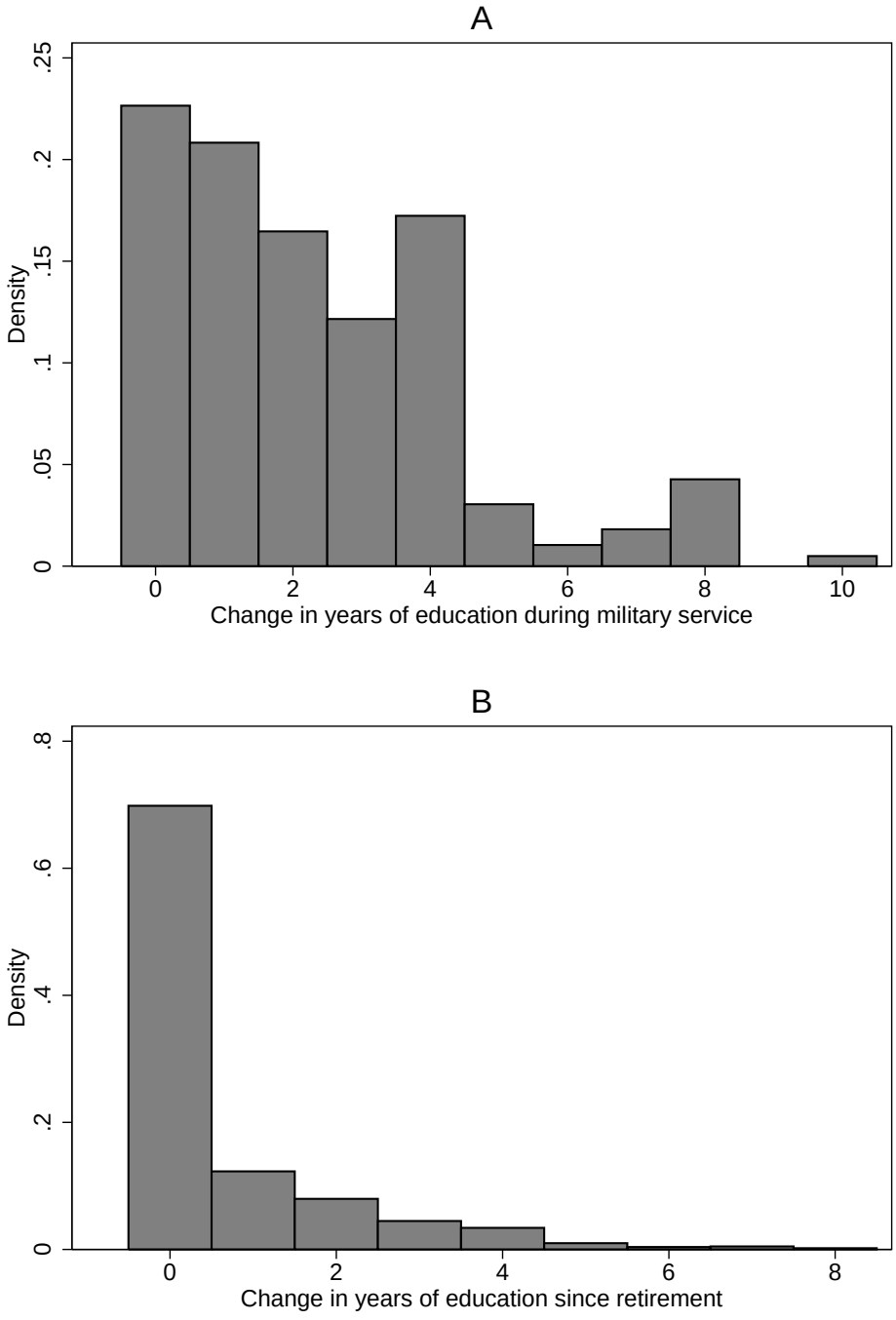
Source: 2003 Survey of Military Retirees and author's calculations. The universe is all male retirees with at least 20 years on active duty aged 40 and older. The data include age at survey in single years; age at retirement is calculated using age at survey minus an estimate of the year of retirement, which is reported in 5-year intervals; age at entering is calculated as age at survey minus single years spent on active duty.

Figure 2: Average education among the NLSY79 cohort by age



Source: 1979 National Longitudinal Survey of Youth (NLSY) and author's calculations. The universe is all members of the NLSY cohort with education data.

Figure 3: Distributions of additional education acquired during and after military service



Source: 2003 Survey of Military Retirees and author's calculations. The universe is all male retirees with at least 20 years on active duty aged 40 and older.

Table 1: Sample characteristics, 2003 Survey of Retired Military

	All males over 40	Officers	Enlisted men	No VA disability	Some VA disability
Average age	56.5	59.1	55.2	55.9	57.0
Average years on active duty	22.8	24.0	22.1	22.3	23.1
Average age at retirement	43.1	45.6	41.7	42.4	43.5
Average age at enlistment	20.3	21.7	19.6	20.1	20.4
Average years of education:					
At entering military	12.8	14.6	11.9	12.9	12.8
At retirement	15.2	18.0	13.7	15.2	15.2
At survey	15.8	18.4	14.5	15.8	15.9
Percent acquiring education during service	77.4	80.8	75.5	74.9	79.0
Percent acquiring education after retirement	30.2	15.0	38.1	25.9	33.0
Percent officer at retirement	34.4	100.0	0.0	34.8	34.1
Average labor earnings, earners	$53,201	$76,021	$41,440	$56,964	$50,296
Percent earners	73.8	72.5	74.4	79.7	69.7
Average household income	$91,794	$127,448	$73,115	$96,495	$88,640
Percent who own home	88.1	93.3	85.3	87.5	88.4
Average VA disability percent rating	28.2	26.7	29.0	0.0	47.1
Percent with any VA disability rating	59.8	59.3	60.1	0.0	100.0
Health (Percent reporting):					
Fair or poor self-reported health	27.6	18.9	32.2	11.6	38.3
Ever had work limitations	45.4	38.7	48.9	18.1	63.7
Ever left a job for health reasons	11.0	6.4	13.5	3.5	16.1
Any difficulty seeing	45.9	38.6	49.7	36.0	52.5
Any difficulty hearing	57.4	56.4	57.9	46.7	64.5
Any difficulty walking	32.1	26.1	35.2	12.8	45.0
Any difficulty lifting 10 lbs	27.2	21.3	30.3	9.6	39.0
Any of these 4 difficulties	75.5	71.2	77.8	62.7	84.1
Any nights spent in a hospital last year	21.3	17.9	23.1	13.2	26.7
Percent African American	12.9	9.1	15.0	9.0	15.6
Percent Hispanic	3.2	1.8	3.9	2.6	3.6
Percent married	85.7	89.8	83.5	85.2	86.0
Percent never married	1.5	0.9	1.8	1.8	1.3
Sample size	16,155	5,554	10,601	6,487	9,668

Notes: The subsample universe is males over the age of 40 with 20 or more years of active-duty service who answered the questions on demographic characteristics, income, and self-reported health status. It excludes 264 individuals who reported ever losing education. Officers are defined as pay grades W1-W5 and O1-O6 and above. See notes to Figure 1 for a discussion of the age data.

Table 2: Marginal effects of years of education at different life stages on health, wealth, and income among military retirees

	Independent variables					
Dedendent variable	**Education at entrance, age 20**	**Change in education during service, age 20-45**	**Change in education after service, age 45-55**	**(Pseudo) R2**	**N**	**Addendum: MFX of lifetime education**
HEALTH MEASURES:						
Self-reported fair or poor health	-0.0254 **	-0.0161 **	-0.0059 *	0.2286	16,155	-0.0158 **
	(0.0024)	(0.0021)	(0.0028)			(0.0018)
Ever had work limitations	-0.0296 **	-0.0148 **	0.0085 *	0.2802	16,083	-0.0129 **
	(0.0033)	(0.0028)	(0.0040)			(0.0024)
Ever left a job for health reasons	-0.0092 **	-0.0036 **	-0.0019	0.1882	16,127	-0.0045 **
	(0.0013)	(0.0011)	(0.0013)			(0.0009)
Any difficulty seeing	-0.0167 **	-0.0062 **	-0.0069 *	0.0392	16,102	-0.0091 **
	(0.0027)	(0.0023)	(0.0033)			(0.0020)
Any difficulty hearing	-0.0101 **	0.0007	0.0054	0.0523	16,040	-0.0011
	(0.0027)	(0.0023)	(0.0033)			(0.0020)
Any difficulty walking	-0.0206 **	-0.0082 **	0.0046	0.1871	16,045	-0.0081 **
	(0.0027)	(0.0023)	(0.0031)			(0.0019)
Any difficulty lifting 10 lbs	-0.0171 **	-0.0060 **	0.0064 *	0.2035	16,070	-0.0055 **
	(0.0024)	(0.0021)	(0.0028)			(0.0017)
Any of these 4 difficulties	-0.0139 **	-0.0048 **	0.0000	0.0909	16,099	-0.0062 **
	(0.0021)	(0.0018)	(0.0028)			(0.0016)
Any nights spent in a hospital last year	-0.0112 **	-0.0028	0.0040	0.0968	15,789	-0.0030 *
	(0.0021)	(0.0018)	(0.0024)			(0.0015)
INCOME MEASURES:						
Log earnings in 2002	0.0552 **	0.0578 **	0.0107	0.1024	11,564	0.0460 **
	(0.0063)	(0.0054)	(0.0078)			(0.0045)
Log household income in 2002	0.0636 **	0.0614 **	0.0269 **	0.1748	16,155	0.0536 **
	(0.0040)	(0.0035)	(0.0049)			(0.0029)
WEALTH MEASURES:						
Home ownership in 2002	0.0067 **	0.0064 **	0.0058 **	0.1282	16,155	0.0063 **
	(0.0016)	(0.0013)	(0.0018)			(0.0011)

Notes: Except for the last column, each row shows partial regression results from a single regression of the endogenous variable shown in the first column on the education variables shown along columns 2-4 and an array of other covariates. Covariates in all regressions include age, the education variables shown in the table, and indicators for officer status, race and ethnicity, marital status, and never married. Health regressions also include past health as indicated by VA disability rating. Income regressions also include an indicator of current self-reported health status being fair or poor. Wealth regressions include current health status and current income. Health and wealth regressions are modeled using a logit, with marginal effects shown. A negative coefficient means education is protective against poor health. Log income is modeled with ordinary least squares (OLS). The last column in each row shows the marginal effects of lifetime years of education from a separate regression in which total education ever attained is the only education varable. Standard errors are in parentheses; statistical significance is denoted by one (5%) or two (1%) asterisks. Data are from the 2003 Survey of Retired Military; the subsample universe is described in the notes to Table 1. Earnings and income are measured on a pretax basis.

Table 3A: Marginal effects of years of education at different life stages on health, wealth, and income among subgroups of military retirees

	Independent variables					
Dedendent variable	**Education at entrance, age 20**	**Change in education during service, age 20-45**	**Change in education after service, age 45-55**	**(Pseudo) R2**	**N**	**Addendum: MFX of lifetime education**
OFFICERS						
Self-reported fair or poor health	-0.0140 **	-0.0104 **	-0.0043	0.2244	5,554	-0.0121 **
	(0.0023)	(0.0023)	(0.0042)			(0.0020)
Log household income in 2002	0.0575 **	0.0529 **	-0.0049	0.0947	5,554	0.0547 **
	(0.0052)	(0.0051)	(0.0103)			(0.0046)
Home ownership in 2002	0.0048 **	0.0037 **	0.0017	0.0892	5,554	0.0042 **
	(0.0014)	(0.0014)	(0.0027)			(0.0012)
ENLISTED MEN						
Self-reported fair or poor health	-0.0381 **	-0.0194 **	-0.0070	0.2119	10,601	-0.0169 **
	(0.0046)	(0.0034)	(0.0037)			(0.0025)
Log household income in 2002	0.0616 **	0.0640 **	0.0352 **	0.0818	10,601	0.0525 **
	(0.0068)	(0.0049)	(0.0056)			(0.0037)
Home ownership in 2002	0.0062 *	0.0077 **	0.0080 **	0.1182	10,601	0.0076 **
	(0.0029)	(0.0022)	(0.0025)			(0.0016)
NO VA DISABILITY						
Self-reported fair or poor health	-0.0174 **	-0.0086 **	-0.0081 **	0.0732	6,487	-0.0106 **
	(0.0026)	(0.0022)	(0.0030)			(0.0018)
Log household income in 2002	0.0688 **	0.0560 **	0.0267 **	0.2119	6,487	0.0528 **
	(0.0060)	(0.0051)	(0.0078)			(0.0043)
Home ownership in 2002	0.0120 **	0.0065 **	0.0062 *	0.1545	6,487	0.0078 **
	(0.0025)	(0.0021)	(0.0031)			(0.0017)
SOME VA DISABILITY						
Self-reported fair or poor health	-0.0292 **	-0.0197 **	-0.0034	0.1976	9,668	-0.0178 **
	(0.0037)	(0.0033)	(0.0042)			(0.0027)
Log household income in 2002	0.0604 **	0.0647 **	0.0278 **	0.1528	9,668	0.0542 **
	(0.0052)	(0.0047)	(0.0063)			(0.0039)
Home ownership in 2002	0.0031	0.0055 **	0.0047 *	0.1148	9,668	0.0047 **
	(0.0020)	(0.0017)	(0.0023)			(0.0014)

Notes: See the notes to Table 2. Each row reports estimates from a separate regression of the dependent variable within the indicated subsample.

Table 3B: Marginal effects of years of education at different life stages on health, wealth, and income among subgroups of military retirees

	Independent variables					
Dedendent variable	**Education at entrance, age 20**	**Change in education during service, age 20-45**	**Change in education after service, age 45-55**	**(Pseudo) R2**	**N**	**Addendum: MFX of lifetime education**
SOME POST-SERVICE EDUCATION						
Self-reported fair or poor health	-0.0469 **	-0.0267 **	-0.0084	0.2152	4,873	-0.0206 **
	(0.0073)	(0.0065)	(0.0053)			(0.0040)
Log household income in 2002	0.0724 **	0.0811 **	0.0291 **	0.0890	4,873	0.0511 **
	(0.0107)	(0.0096)	(0.0079)			(0.0059)
Home ownership in 2002	0.0067	0.0054	0.0032	0.1023	4,873	0.0045
	(0.0042)	(0.0037)	(0.0031)			(0.0023)
NO POST-SERVICE EDUCATION						
Self-reported fair or poor health	-0.0204 **	-0.0134 **		0.2279	11,282	-0.0159 **
	(0.0026)	(0.0022)				(0.0020)
Log household income in 2002	0.0577 **	0.0548 **		0.1997	11,282	0.0558 **
	(0.0045)	(0.0039)				(0.0036)
Home ownership in 2002	0.0057 **	0.0058 **		0.1415	11,282	0.0058 **
	(0.0017)	(0.0015)				(0.0013)
SOME EDUCATION DURING SERVICE						
Self-reported fair or poor health	-0.0333 **	-0.0157 **	-0.0072 *	0.2329	12,496	-0.0183 **
	(0.0030)	(0.0025)	(0.0032)			(0.0020)
Log household income in 2002	0.0662 **	0.0573 **	0.0300 **	0.1750	12,496	0.0533 **
	(0.0048)	(0.0041)	(0.0055)			(0.0033)
Home ownership in 2002	0.0089 **	0.0042 **	0.0048 *	0.1215	12,496	0.0056 **
	(0.0018)	(0.0015)	(0.0020)			(0.0012)
NO EDUCATION DURING SERVICE						
Self-reported fair or poor health	-0.0117 *		-0.0018	0.2198	3,659	-0.0081 *
	(0.0048)		(0.0059)			(0.0041)
Log household income in 2002	0.0580 *		0.0117 *	0.1566	3,659	0.0435 **
	(0.0081)		(0.0109)			(0.0072)
Home ownership in 2002	0.0036		0.0073	0.1466	3,659	0.0049
	(0.0033)		(0.0042)			(0.0028)

Notes: See the notes to Table 2. Each row reports estimates from a separate regression of the dependent variable within the indicated subsample.