Preliminary and Incomplete

Understanding Health Differences by Education

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December 31, 2006

We are grateful to Lisa Vura-Weiss, Tom Vogl and Rebecca Lowry for excellent research assistance and the National Institutes on Aging for research support.

In 1990, a 25 year-old male college graduate could expect to live another 54 years. A high school dropout of the same age could expect to live 8 years fewer (Richards and Barry, 1998). This enormous difference in life expectancy by education is true for every demographic group, is persistent – if not increasing – over time (Kitagawa and Hauser, 1973; Elo and Preston, 1996), and is present in other countries (for the UK: Marmot, Shipley, and Rose, 1984; for Canada Mustard, et al. 1997), including northern European countries (Kunst and Mackenback, 1994) and developing countries (see Cutler and Lleras-Muney 2006 for additional references). It is also largely unexplained. We search for explanations in this paper.

We focus our analysis on the health behaviors (rather than the health) of the better and less well educated. Behavioral differences by education are large. Nearly 30 percent of people with less than a high school degree smoke, three times the rate of people with a college degree. Twenty-four percent of people with less than a high school degree are obese; twice the rate as college graduates. Eight percent of adults who have not completed high school are heavy drinkers, double the rate of college graduates. The impact of these three behaviors on overall differences in health is significant. Mokdad et al. (2004) estimate that nearly half of all deaths in the United States are attributable to smoking, excessive weight, and heavy alcohol intake. Nor are these three behaviors anomalous; virtually every health behavior we identify is better for the better educated.[1]

[1] Observed health behaviors do not however explain all of the differences by education or other SES measures. This implies that there must be unobserved health behaviors that also contribute to health differences, or alternatively, that the more educated might be healthier due to reasons/behaviors that are not known to be health improving. We ignore these here.

Unlike previous papers, rather than concentrating on the effect of education on a subset of health or health behaviors we look at an extensive array of behavioral outcomes.

In the course of our research, we use a number of different data sets. These include the National Health Interview Survey, the National Longitudinal Survey of Youth, the National Survey of Midlife Development in the United States, and the Health and Retirement Study. We use so many data sets because no single source of data has information on all the theories we seek to test.

The most intuitively plausible explanation for economists is that education matters for health because education is associated with higher resources. To the extent that better health requires money, better educated people will demand more of it. Smoking and heavy drinking belie this explanation, however. In each case, not engaging in the activity is both cheaper and healthier.[2] More sophisticated econometric analysis confirms this for a range of health behaviors. The link between income and education explains at most 20 to 30 percent of the effect of education on health.

By definition, better educated people know more; part of that knowledge may be how to maintain a healthy life. We show, however, that this explanation is not the case either. Health gradients exist for behaviors where knowledge is universal (as with the harms of smoking) and where decisions are recommended by a specialist (cancer screening, for example). General knowledge is somewhat more important than health-specific knowledge. AFQT scores available in the National Longitudinal Survey of Youths explain about 10 percent of the effect of education on health behaviors.

[2] The impact of resources on obesity is mixed. On the one hand, substantial quantities of food are expensive. But high calorie food is also very cheap (fast food, for example).

The third theory is that education matters because it reflects discount rates, risk aversion, or the value of the future, which are also related to education. Both education and healthy living are investments in the future, to be taken more by the risk averse and those with a long view. Such 'third factor' theories are common in economics (see Fuchs, 1982). We know these explanations cannot be the entire story, since evidence shows that exogenous changes in education are associated with differences in health behaviors (Lleras-Muney, 2005; Currie and Moretti, 2003).[3] Still, one might suspect that these theories explain some of the differences, especially since education itself may change these parameters: education may make one more likely to think about he future, or make one less risk averse. We are hard-pressed to support this view, however. While measurement of discount rates, risk aversion, and the value of the future is not easy, proxies for each are only weakly related to education and do not explain a good deal of the link between education and health. [4]

The fourth theory is that education allows people with the same desires to act in different ways. In the formulation of Michael Grossman (1972), one can think of education as a productive input: people who are better educated know how to combine resources better to produce higher utility. It is not entirely clear how to test this theory. We consider a loose proxy by looking at how health behaviors change before and after retirement. A major resource of the better educated is the time they can devote to health. Thus, if this theory is correct, it might be the case that behaviors narrow after retirement. We do not find this to be the case, however. We also analyze whether more educated use

[3] Lleras -Muney (2005) shows that adults affected by compulsory schooling laws when they were children are healthier than adults who left school earlier. Currie and Moretti (2003) show that women living in counties where college is more readily available have healthier babies than women living in other counties.

different methods to quit smoking and whether they are more successful at quitting conditional on the method employed. We find this to be the case, although there is a substantial part of the education effect that remains unexplained. This suggests that the more educated not only choose different inputs, but are indeed more successful at combining them. But we have only weak evidence to support this theory.

Finally we consider theories of psychological decision-making: the less educated have worse behaviors because they are under more stress, because they suffer from depression or anxiety, or because they do not follow rules as readily, and hence cannot translate intentions into actions. We consider a variety of tests of these theories, including measures of how hectic life is, possible personality disorders, and several stress measures. In each case, we come up dry.[5]

In the end, we can only speculate about why health and education are so strongly related. We suggest that it may be a difference in the way that information is processed – the extent to which abstract information is translated into concrete actions. Some suggestive evidence argues in favor of this theory, but the case is by no means ironclad.

The paper is structured as follows. The first section presents basic facts on the relation between education and health. The second section considers theories about why education and health might be related: the resources theory; the knowledge theory; the future orientation theory; and the stress theory. These theories are then tested in the next four sections. The final section concludes.

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[4] Cutler and Glaeser (2006) also note that the income explanation argues that health behaviors should be highly correlated across people. They are not.

[5] The theories we consider assume that education affects health, or that a third factor affects both education and health. Part of the link between adult education and health may be the result of childhood health differences that are correlated with late life health and that affect educational attainment (Case, Lubotsky, and Paxson, 2002). While important, we suspect this is not the entire explanation.

I. Education and Health Behaviors: The Basic Facts

Before discussing theories of the link between education and health, we present some basic facts relating the two.[6] Health behaviors are asked about in a number of surveys. Probably the most complete is the National Health Interview Survey (NHIS). In order to examine as many behaviors as possible, we use data from a number of NHIS years, 1987, 1990, 1991, 1992, 1994 and 2000. We group health behaviors into eight groups: smoking, alcohol use, diet/exercise, illegal drugs, household safety, automobile safety, preventive care, and care for people with chronic diseases (diabetes and hypertension). Within each group, there are multiple measures of health behaviors. Because the NHIS surveys are large, our sample sizes are up to approximately 23,000.

In summarizing the data, we want to avoid confounding by racial groups; hence, we focus on whites only.[7] Table 1 shows the health behaviors we analyze and the mean rates in the adult population. We do not remark upon each variable, but rather discuss a few in some depth. Current cigarette smoking is a central measure of poor health. Mokdad et al. (2004) estimate that cigarette smoking is the leading cause of preventable death in the country (accounting for 18 percent of all deaths). Twenty-three percent of adults in 2000 smoked cigarettes. The next columns relate cigarette smoking to years of education, entered linearly. We control for single year of age dummies and a dummy for females, since other demographic and socioeconomic correlates might also be affected by education and we want a total effect of education on health. The regression shows that each year of education is associated with a 2.5 percentage point lower probability of smoking. To put it another way, a college grad is 10 percentage points less likely to

[6] Cutler and Lleras-Muney discuss some differences in health behaviors by education.
[7] Results are similar for other demographic groups.

smoke than a high school grad. Given that smoking is associated with 7 years shorter life expectancy, this difference is immense.

Entering education linearly may not be right. One might imagine that some base level of education is important, and that additional education beyond that level would not reduce smoking. That is not correct, however. The first part of Figure 1 shows the relationship between exact years of education and smoking. If anything, the story is the opposite of the 'base education' hypothesis; the impact of education is greater at higher levels of education, rather than lower levels of education.

Next to smoking, obesity is the leading behavioral cause of death. While all measures of excess weight are correlated, we focus particularly on obesity (defined as a Body Mass Index or BMI equal to or greater than 30). Twenty-two percent of the population in 2000 self-reported themselves to be obese.[8] This too is negatively related to education; each year of additional schooling reduces the probability of being obese by 1.4 percent. The figure by exact year of education is similar to that for smoking. Obesity declines particularly rapidly for people with more than 12 years of education.

Heavy drinking is similarly harmful to health. We focus on the number of days in which the person had five or more drinks in the past year. The average person drank heavily about 6 days (non-drinkers are coded as having drank heavily 0 days), and the value for the average drinker is 11 days. Each additional year of education lowers this by 2 days among drinkers, but only by 0.8 days for all. Education affects heavy drinking at both very low levels of education and higher levels of education. Interestingly the better educated are more likely to drink moderately.

[8] Note differences between observed and self-reported obesity. They are similar, though observed is somewhat greater.

Self-reported use of illegal drugs is relatively low; only 2 to 8 percent of people report using such drugs in the past year. Use of illegal drugs is generally unrelated to education (at least for marijuana and cocaine). But better educated people report they are more likely to have ever tried these drugs. Better educated people seem better at quitting bad habits, or at controlling their consumption. They appear to do so not by avoiding these behaviors altogether (as with drinking), but by keeping consumption below harmful levels. This shows up in cigarette smoking as well, where better educated people are much less likely to be current smokers than they are to have ever smoked.

Household safety is positively related to education in virtually all cases. Better educated people keep dangerous objects such as handguns safe and know what to do when something does happen (for example, they know the poison control phone number). As the next rows show, better educated people also wear seatbelts more regularly. The mean rate of always wearing a seatbelt is 69 percent; each year of education adds over 3 percent to the rate. The analysis of seatbelt use is particularly interesting. Putting on a seatbelt is as close to costless as a health behavior comes. Knowledge of the harms of non-seatbelt use is also nearly universal. Ninety-four percent of the population agrees that if they were in an accident they would want to have their seat belt on, and just as many believe their state has seat belt laws.[9] But the gradient in health behaviors is still extremely large. Further, the education gradient shows up primarily for those with relatively more education – above 10 years (see figure 1).

Better educated people engage in more preventive and risk control behavior. Better educated women get mammograms and paper smears more regularly. Better

[9] Motor-vehicle Occupant Safety Survey, volume 2: seat belt report. March 2000: http://www.nhtsa.dot.gov/people/injury/research/SafetySurvey/, accessed on December 16, 2006.

educated men and women get colorectal screening and other tests. Better educated people are more likely to get flu shots. Among those with hypertension, the better educated are more likely to have their blood pressure under control. Services involving medical care are the least clear of our education gradients to examine, since access to health care matters for receipt of these services. We thus focus more on the other behaviors. But, these data are worth remarking on because it does not appear that access to medical care is the big driver. Controlling for receipt of health insurance does not diminish these gradients to any large extent (the coefficient on receipt of a mammogram is reduced by only XX percent, for example). Seeing a doctor may be like wearing a seatbelt; it is something that better educated people naturally do more regularly.

Table 1 makes clear that education is associated with an enormous range of positive health behaviors. Indeed, the lack of an anomalous relationship is far rarer than the finding of a relationship. An obvious summary measure would be a weighted average of these coefficients, with weights corresponding to the impact of the variable on quality-adjusted life. Such a set of weights is not available, however. To gauge the impact of education differences for overall health, we focus on those behaviors that are most associated with poor outcomes: smoking, obesity, and to a lesser extent heavy drinking. The other outcomes remain important in testing theories about why education is related to health, however.

At the same time that many health behaviors are related to education, these behaviors are not particularly highly correlated across individuals. Cutler and Glaeser (2006) show that the correlation between different health behaviors is generally about

0.1.[10] Were the difference in health behaviors driven by fixed aspects of individuals, such as discount rates or the value of the future, we would expect that health behaviors would be highly correlated: people who care about their health would maximize longevity in all ways. These results presage our later findings that utility-function attributes do not explain a good part of the education gradient in health behaviors.

II. Why Might Education Affect Health?

To understand the link between education and health, we start with a simple model. We suppose that individuals live for a maximum of two periods, which we label young (*y*) and old (*o*). Individuals choose two consumption items each period, c_t and b_t. c_t has no impact on future health; b_t does. Both goods increase current utility levels. We assume that the probability of living to the second period is given by $p(b_y)$, where behaviors are normalized so that higher levels reduce survival (think of smoking): $p'<0$. Behaviors may or may not be costly. Joining a gym is expensive. But cutting out cigarettes or eating only half as much saves money. As fits most of our examples, we assume that b_y does not have substantial material cost. The price of the other consumption good c is normalized to one.

Lifetime utility is given by:

$$W = U(c_y, b_y) + \beta \cdot p(b_y) U(c_o, b_o)$$

and the lifetime budget constraint is given by:

$$(w - c_y)(1 + r) = c_o$$

[10] Correlations of binary variables are not obviously interpretable. We show, however, that these correlations are small..

where β is the discount rate. For simplicity, we assume that individuals earn exogenous labor income *w* in the first period only. Consumption in the second period is determined by saving in the first period and by the interest rate, *r*.

How might education affect health? We consider four reasons. The first is a direct effect of knowledge. In the model, knowledge is represented by the function $p(b_y)$. People who know that behavior b_y harms health in older age will perceive a lower marginal utility of consumption of b_y than people without this knowledge. Their consumption will thus be lower.[11]

A second effect of education is through income (and in a more general model through all outcomes that education may improve such as marriage rates/quality). Better educated people earn more than less educated people. As a result, consumption of *c* will be higher in both periods of life, and so will utility. To benefit from this higher utility, however, people need to be alive. The value of increased income can be approximated as $\Delta W = \beta \cdot p(b) \cdot (1+r) U_{c_{t+1}} \cdot \Delta w$. Better educated people will reduce b_y to increase their expected utility from consuming greater levels of c_o. Hall and Jones (2004) use this theory to suggest that increased income should lead to substantial levels of medical spending.

A third effect of education is through the discount rate or risk aversion – closely related in this model. The theory that is typically told is one of third factors leading to both education and health (Fuchs, 1982). People who have low discount rates value the

[11] To see this, consider the choice of b_y. The first order condition for b_y is given by $U_{b_y} = -\beta \cdot p(b_y) \cdot U(c_o, b_o)$. As *p'* falls (knowledge becomes more widespread), the marginal benefit of good *b* rises, and hence people consume less of good *b*.

future more. To ensure realization of future utility, they put more effort into education and also invest in health promotion. Thus, education and healthy behaviors are correlated, though the relationship is not causal. Risk aversion plays the same role here. More risk averse people will live healthier lives, to guard against the possibility of early mortality. If education is associated with less risky streams of future consumption, they will also invest more in education.

The final theory of the importance of education is that education allows inputs to be combined more productively (Grossman, 1972), what is known as "productive efficiency". For example, everyone may know that smoking is bad for them, but better educated people will be able to implement strategies to lower smoking. This theory is not represented directly in equation (1), but one might posit it in a formulation of b_y. If b_y were the sum of a default $(\underline{b})$ and an effort term that is related to education $(f(e))$, so that $b_y = \underline{b} - f(e)$, one could interpret $f(e)$ as reflecting the value of education in changing behavior.

III. Education as Command Over Resources

Better educated people earn more than less educated people, and these differences in earnings could affect health. There are two channels for this. First, higher income allows people to purchase goods that improve health, for example health insurance. In addition, higher income increases steady-state consumption, and thus raises the utility of living to an older age. We consider direct measures of the value of the future in a later section. We focus here on the impact of current material resources.

The NHIS contains a number of measures of economic status. We include controls for family income (a set of dummies for each of the income bracket), major activity (whether individual is working, at home, in school, etc), and a dummy variable for whether the person is covered by health insurance. Family income is a natural control, although an ideal measure would be permanent income (average income over a period of time), rather than a single year's income. Finally, health insurance coverage is an obvious control in a model of health behaviors. Geographic measures (region and urban location) control for regional differences in purchasing power, whereas family size, and marital status are important in that family income maybe a poor proxy of individual resources, depending on the number of individual that have claims on that income and also on how the family allocates resources among its members.

There are clear endogeneity issues with these variables. For example, current income might be low because a person is sick. Sicker people may be more or less likely to get insurance, depending on the operation of public and private insurance markets. In each case, the coefficients on those variables may not be the 'true effect', and furthermore, including these variables may bias the coefficient of education. Nevertheless, if the newly included variables are exogenous, by including these variables in the regression, we can to assess the extent to which education is a proxy for these other variables. Thus the results are suggestive, although by no means conclusive.[12]

[12] Another limitation of our results is that we do not have good measures of permanent income, but we do to some extent test how important it is in the regressions that control for the value of future life, a proxy for presented discounted utility, which should incorporate expectations on permanent income.

The second columns in Table 1 report regressions including these additional variables.[13] Adding economic controls explains some of the education effect. The coefficient on years of education in the current smoking equation falls by 21 percent, for example. The coefficient on body mass index falls by 30 percent (roughly the same as the fall in the coefficients on overweight and obese), and the coefficient on heavy drinking falls by 8 percent. A rough consensus is about a 20 percent reduction in these major adverse behaviors. Scanning the last column of Table 1 suggests that these coefficients are not out of line. Some changes in the education effect are very large, and others are very small, but most hover around 20 to 30 percent. In the appendix, we report similar results using other surveys, some of which contain better controls—for example in the HRS we can control for assets and parental education. The qualitative results are the same across surveys (TO BE ADDED).

In total, therefore, we estimate that material resources account for about 20 to 30 percent of the impact of higher education on health behaviors. We now turn to other explanations for the remaining 70 to 80 percent. In all future regressions we control for these variables in the NHIS, and test the explanatory power of additional controls. Other surveys that we use provide a richer set of family background variables, whenever possible we control for as many of these as we can. Details on the controls that are used are listed at the bottom of each table.

[13] Different health variables are available in different NHIS surveys, not all of which have information on health insurance. We note in the table which regressions do not have controls for health insurance.

IV. Education as Knowledge

The second reason why education might affect health behaviors is the obvious one: better educated people know more than less educated people, and this knowledge might be about appropriate health behaviors. The data above suggested this is unlikely to be the entire explanation for behavioral differences, since many behaviors are generally known in the population.

But we can test the theory directly as well. The 1990 NHIS survey asks people a number of questions about the harms from smoking and drinking. Respondents were asked whether smoking increased the chances of getting several diseases (emphysema, bladder cancer, cancer of the larynx or voice box, cancer of the esophagus, chronic bronchitis and lung cancer). For those under 45, the survey also asked respondents if smoking increased the chances of miscarriage, stillbirth, premature birth and low birth weight; and also whether they knew that smoking increases the risk of stroke for women using birth control.

Similarly respondents were asked whether heavy drinking increased one's chances of getting throat cancer, cirrhosis of the liver, and cancer of the mouth. For those under 45, the survey also asked respondents if heavy drinking increased the chances of miscarriage, mental retardation, low birth weight and birth defects.

Table 3 examines the relationship between education, knowledge, and health behaviors. For each health measure, we report two sets of regressions. The first includes the years of education variable and all the demographic and economics controls. This coefficient is similar to that in Table 1, with the primary difference being that we use a

different year of the NHIS, which contains the knowledge questions. The next columns also include a dummy variable for whether the person answered all questions correctly.

Knowledge is important for behaviors. People who answered all smoking questions correctly are less likely to smoke, and people who answered all drinking questions correctly are less likely to drink, and drink less when they do. But these additions do not materially affect the coefficient on years of education. The maximum reduction in the education coefficient is 4 percent, and we cannot reject the hypothesis of no change in the education effect.

One might not expect the effect of education to be the same for people with different levels of knowledge. It might be that education is only effective when people know what to do, for example by knowing how to translate knowledge into action. We tested for this by interacting years of education with the dummy variable for whether the person answered all of the knowledge coefficients correctly. These results (not reported) do not suggest major differences in either the smoking or drinking models. Education generally mattered a bit less for those with more direct knowledge about the role of risk in disease, but the differences were not large, and the effects were not always statistically significant. We conclude that specific knowledge of health risks is not the reason for the education gradient in health behaviors. These results are similar to those reported by Meara (2001) and Kenkel (1991).

Knowledge may be specific or general. People who are more educated are smarter overall, and this general intellectual ability may translate into an ability to analyze complex decisions and make appropriate changes. To consider their theory, we use a measure of general knowledge present in the National Longitudinal Survey of

Youth (NLSY): the AFQT. The AFQT was administered at baseline when the respondents were 14 to 17 years old. We use the years of education that are reported at the time of follow-up (either in 1998 or 2002 depending on the outcome of interest). AFQT scores naturally differ by education. College graduates score about 45 points higher on average than high school graduates (see table 2). Although we interpret AFQT to be a measure of ability or IQ – as most researchers do – it is possible that it is also a measure of schooling, in which case we may overestimate the role of ability and underestimate the role of education by including both variables together.

Education and health behaviors are highly correlated in the NLSY, as in the NHIS. Indeed, the effect of education is somewhat greater in the NLSY than in the NHIS, especially for smoking. This is not surprising since the NHIS spans a greater age range, and differential mortality by people with worse health behaviors would leave a residual pool of predominantly non-smokers at older ages.

As table 4 shows, AFQT scores are associated with health behaviors. People with higher AFQT scores smoke less, are less likely to be a heavy drinker, exercise more, weigh less, and read food labels more often. This difference in general knowledge is not the major explanation for education gradients in health behaviors, however. The smoking coefficient declines by 20 percent when the AFQT score is included, the BMI coefficient falls by 4 percent, and the heavy drinking coefficient falls by 15 percent. Thus, while there is some impact of general knowledge on behavior – perhaps 10 percent of the effect of education on average – that is not the primary reason why education is related to better health.

V. Utility Function Characteristics: Discount Rates, Risk Aversion and the Value of the Future

A third explanation for the link between health and behaviors is that discount rates, the value of the future, or risk aversion vary across individuals, and these traits explain both education investment and health investment. The source of differences in utility functions is not clear. Education may lead people to have lower discount rates (Becker and Mulligan, 1997): for example if education raises future income, individuals have an incentive to invest in lowering their discount rate. Education may also lead people be more risk averse. But these parameters may be distributed randomly, inherited, or a product of the early childhood environment.

We already noted evidence that is inconsistent with this theory. Even though essentially all health behaviors are correlated with education, health behaviors are not particularly correlated with each other. If the only variation across individuals were discount rates or risk aversion, however, behaviors would be highly correlated across individuals. Still, even if differences in the utility function are not the primary reason for differences in health behaviors, they may explain some of the differences. It is thus valuable to test this theory directly.

Measures of discount rates or risk aversion are not readily available on most surveys. Indeed, it is not entirely clear that there is a single measure of discounting that applies to all settings.[14] With the acknowledgement that our measures are poor, we analyze them as they are.

[14] Not all goods are traded in markets, so there can be different discount rates for money, health, time, etc.

We start first with the overall value of the future. Preliminary evidence on the value of life does not suggest that this is an important explanation. Figure 2 for example shows that the more educated report wanting to quit smoking at roughly the same rates as the less educated, which would not be the case if consumption was chosen optimally but the discounted value of the future was lower for the more educated. The figure also shows both groups report planning to quit in the next 30 days at roughly the same rates.

Probably the best measures of discounting and of the value of the future comes from the National Survey of Midlife Development in the United States, or MIDUS. MIDUS was conducted in 1994-95 as part of a MacArthur Foundation Aging Network. The sample is representative of the population as a whole, although the survey was on paper and was very long. Hence, response rates at the top and bottom of the income spectrum were relatively low (CITE). There are about 3,000 observations in MIDUS, although for certain outcomes the sample is considerably smaller.

MIDUS has several measures of the value of the future. We use an overall summary question about future expectations: individuals are asked “Looking ahead ten years into the future, what do you expect your life overall will be like at that time?”[15] There are some questions as well that can be used as proxies for discount rates. Individuals were asked whether they agreed with the following statement: "I live one day at a time and don't really think about the future".[16] We code those that strongly disagree as being future-oriented.

[15] Individuals were also asked to evaluate what various aspects of their lives might be like in the future, in several dimensions (health, willingness to learn, energy, caring, wisdom, knowledge, work, finances, relationship with others, marriage, sex and relationship with children). We investigated whether results differed when using these more detailed questions, but found essentially no difference, in terms of the education gradient.

[16] There are other possible proxies for how future oriented individuals are. The results are not affected by the choice of proxy.

Table 2 shows summary measures of these variables by education. The more educated are equally satisfied with their current life as the least educated, and those with some college report the lowest current satisfaction. The relationship between education and future satisfaction is also not linear, being the highest among the college educated, followed by high school graduates, those with some college and high school dropouts. Although these satisfaction measures are not very highly correlated with education, Figure 3 shows that the ratio of future to current satisfaction is monotonically increasing in education—thus the more educated do indeed value the future more *relative* to the present.

MIDUS asks about some measures of health, though not as many as dedicated health surveys. The list of health measures is shown in table 5. It includes smoking and weight reduction, though not current alcohol consumption. Questions are also asked about general health behavior, illegal drug use, and receipt of preventive care.

Table 5 shows results from the MIDUS survey. The first columns report means of the independent variables. Where we can compare, the means are very close to the national samples in the NHIS. The education coefficients are also similar, if anything larger (perhaps a result of fewer less educated people). Each year of education reduces smoking by 3.2 percent. In this sample, education is not always statistically significant, but the samples are small.

The theory above suggests 1-that people who are able to plan will invest more in health; 2-that those with higher future utilities will invest more in health; and 3-that there is an interaction term between the two: a higher value of the future will affect behavior more by those with better planning ability. The next columns show the impact of

including measures of current and future life satisfaction, the ability to plan for the future, and the interaction of planning and future life satisfaction. There is no significant impact of these variables on education. Indeed, in some cases the addition of these variables actually increases the effect of education. For those outcomes for which there is a significant effect of education in the baseline regressions, the largest reduction in the effect of education is about 16% for vigorous activity. There are two outcomes for which there is a very sizable reduction in the effect of education (work hard on staying healthy and blood pressure control) but the coefficient of education is never significant and therefore we ignore these results. Overall the impact of adding these variables is small.

Because our samples are small and the proxy for discount rates may not be very good, we have experimented with other measures as well. One might imagine the simplest behavior to undertake as being a good proxy of discounting. For example, using a seat belt is so costless that differential use across individuals might well indicate the value of the future. We have used this as a proxy for discount rates in the NHIS. The results (in appendix table 1) again suggest little impact of discount rates on education. The education coefficient falls by only about 10 percent with the seat belt control.

Neither MIDUS nor NHIS have measures of risk aversion. In order to investigate the role of risk aversion we use data from the Health and Retirement Survey (HRS). The HRS in 2002 asked questions that were explicitly designed by economists (see Barsky et al., 1997) to allow for categorization of individuals into 4 risk aversion categories. Respondents are first asked if he/she would risk taking a new job, given that family income is guaranteed now. The new job offers a chance to increase income but also carries the risk of loss of income. If the respondent says he/she would take the risk, the

same scenario is presented, but with riskier odds. Additional details on the construction of the risk aversion categories are in the Appendix. Table 2 shows that education is not monotonically related to risk aversion, with those with a high school degree or some college being the most risk averse, which already suggests risk aversion is not a very promising factor.

The results are presented in Table 6. The addition of the risk aversion categories has no impact on the coefficient of education. Indeed, the categories for risk aversion are not very consistently related to health behaviors. Thus it may be that this measure, although perhaps a good measure of risk aversion to income shocks, may not be a good measure of tolerance of health risks.

V. Education and Productive Efficiency

Deciding on optimal health behaviors requires formulating and carrying out plans, which can often be complex. The vast majority of smokers, for example, wish to quit smoking, but they lack the time or willpower to carry it out. It may be that time or willpower differ by education, and so explain differences in health behavior.

Several pieces of evidence suggest this theory might have merit. More educated people are better able to use complex technologies/treatments than less educated individuals. Goldman and Smith (2002), for example, document that the more educated are more likely to comply with HIV and diabetes treatments, which are extremely demanding. Rosenzweig and Schultz (1989) similarly show that contraceptive success rates are identical for all women for "easy" contraception methods such as the pill, but the rhythm method is much more effective among educated women. The more educated

may also be better at learning. Lleras-Muney and Lichtenberg (2002) find that the more educated are more likely to use drugs more recently approved by the FDA, but this is only true for individuals who repeatedly purchase drugs for a given condition, so for those that have an opportunity to learn. Similarly Lakdawalla and Goldman (2001) and Case, Fertig and Paxson et al. (2005) find that the health gradient is larger for chronic diseases, where learning is possible, than for acute diseases.

We consider first time constraints. The better educated spend more time at work than the less educated, suggesting behavioral change would be harder for them. But non-working time is not synonymous with leisure. It may be that the daily hassles of life (cooking, errands, children, etc.) involve more intensive effort by the less educated, and hence leave them less time for health planning or the mental energy devoted to behavioral change.

The main difficulty in testing this theory is that time diaries are notoriously incomplete, and are not linked to health behaviors. As a partial proxy, we look at behaviors before and after retirement. Prior to retirement, the time available for health decisions may be greater among the better educated. After retirement, time allocation will be more equal. We test this theory using data from the Health and Retirement Study. We relate health behavior to education, whether the person is retired, and an interaction of the two. In one set of regressions we include individual fixed effects; in another we do not.

The results, shown in table 7, are similar in each case. In some cases, retirement *increases* the gradient by education (for example the gradient in exercise), but most of the time the behavior of the more and the less educated does not change differentially after

retirement. Although this evidence is very indirect, they suggest that time constraints are not responsible for education gradients.

Beyond time, it may be that the better educated are better at following rules than the less educated. Quitting smoking may involve rules such as not associating with smokers socially, not allowing cigarettes inside one's house, not going to bars or restaurants where smoking is permitted, and similar restraints. These rules can be difficult to follow, and the ability to do so may vary with education.

To test this, we need data on the propensity of people with different education groups to follow rules. Such data are not routinely asked. The MIDUS survey has some questions on this, however. Specifically, the MIDUS asks people how many rules the respondent has in his/her life, how strict the respondent's father was with rules in childhood, and how strict the respondent's mother was with rules in childhood. Options were "a little," "somewhat," and "a lot."

Table 8 examines the impact of controlling for the propensity to follow rules on the education difference in health behaviors. The impact of including rules is very small. The impact of education on current cigarette smoking falls by only 1 percent, for example. In other cases, the coefficient on education increases in magnitude. This theory thus does not receive empirical support.

These results raise the question of how the better educated do it. Consider smoking, for example. Our earlier results show that better educated people are less likely to have ever smoked, and more likely to have quit smoking. This latter issue raises the question of whether the better educated people use different methods to quit smoking, or whether they are more successful at the same method (as with the finding of Rosenzweig

and Schultz, 1998, on contraceptive use). The former suggests some form of allocative efficiency, the latter is consistent with productive efficiency differences.

Using a special supplement of the NHIS on smoking, we look at whether the more educated use different methods to quit smoking (allocative efficiency) and whether conditional on the method employed, the educated are more successful at quitting (productive efficiency). The results are in Table 9. The first column shows the baseline effect of education on quitting. About 50% of ever smoked report having quit, and each year of education lowers the probability by about 2 percentage points. In the second column we add controls for the type of method used, for the number of times the individual reports trying to quit and for the number of different methods they used. These results show that the better educated choose different quitting methods; adding controls for methods used lowers the effect of education by 21%.

In the third column we interact these variables with education. Interestingly the more educated are more likely to quit with fewer attempts. Also as predicted, all of the interactions with method used are positive, although none is individually significant. Jointly all the interactions are significant, but the interaction with method used is only weakly significant. This evidence provides weak support for both the allocative and productive efficiency hypotheses. However the main effect of education actually increases, and remains significant. Thus there is a substantial part of the effect of education on quitting that is unrelated to the methods that individuals use to quit.

VI. Impaired Decision-making

The most prominent theory outside of economics to explain social gradients in health in animals (for example see Sapolsky, 1993, 1998; though perhaps not, see Pettecrew and Davey-Smith 2003) and perhaps in humans (Marmot 2002) is the relative position one has in the social distribution. It is hypothesized that this relationship emerges because individuals at the lower end of the hierarchy have less control over their lives and are constantly subjected to arbitrary demands by others, causing increases in stress and subsequently resulting in stress-related diseases. If education changes one's relative rank, then this could explain the education gradient. It is very difficult to obtain measures of relative rank in modern human societies, but we can test whether education gradients are mediated by stress and self control, which are the main mechanisms emphasized by this theory.

Good measures of stress are difficult to come by. We use some proxies that are available. First we look at the MIDUS and add several controls for whether individuals worry and feel stressed at home or at work. Results are presented in Table 10. For those coefficients that were significant in the baseline regression, the coefficient of education is unaffected by the inclusion of these variables.

In the NLSY, we can also control for several measures of sense of control. To our knowledge these are the best self-reported measures available in any survey. Our controls include a self esteem score, a score about a sense of self control, a score about a sense of control over one's life, depression and other personality measures possibly related to deviant behavior such as whether the individual was charged with a crime by 1979. These results are reported in Table 11. The first column shows the effect of

education with only basic demographic controls, the second column adds measures of resources (current and past), family background measures and AFQT. These results suggest that general intelligence and resources explain about 45% of the education gradient, which is consistent with our previous results. The addition of sense of control variables reduces the effect of education by a very small amount, on average 7%. For two variables, light drinking and depression, we can explain the entire education gradient using family background resources and personality measures. For other variables, we can explain only 30% of the education coefficient with the available controls. There remains a large and significant effect in spite of our extensive list of controls.

Psychological disorder is another possible reason for differential health behaviors. Of particular importance are depression and anxiety. People with depression suffer a loss of interest in most activities, dissatisfaction with life, feelings of hopelessness and helplessness, and suicidal thoughts. Anxiety is characterized by persistent worry over many activities and events. Individuals suffering from these diseases may not think their future will be very good or may not be able mentally to make behavioral changes. The NHIS contains some information about depression and anxiety. Results from these regressions are in appendix table 2. Again, the addition of these controls has a small effect of the education coefficient, with the largest decline being of 14% for the number of cigarettes smoked and most others being much smaller.

VII. Conclusion

Our results to this point do not yield a firm explanation for why education is related to health. We can explain some of the education effect by resources and general

knowledge. In a number of different data sources, these factors account for perhaps 30 to 40 percent of the education gradient – though this is likely overstated, given the reverse impact of poor health on income. Even with this overstatement, however, well over half of the education gradient in health behaviors remains to be explained.

The obvious question is what we are missing. Our results here are necessarily speculative, but one possibility deserves comment. It may be that more and less educated people intellectualize information differently. For example, anti-smoking information has generally been presented as factual information, while pro-smoking advertising has been more sensory (the manliness of smoking, for example). Perhaps factual data appeals more to the better educated and sensory input appeals more to the less educated.

Some evidence in favor of this theory comes from the history of smoking reductions. Prior to the Surgeon General's report on the harms of smoking in the early 1960s, better educated people smoked the same as, or more than, the less educated. The big change since the Surgeon General's report has been a reduction in smoking among the better educated. The bulk of the less educated still believe that smoking is harmful for them, but the sense of immediacy associated with that belief may differ. Other evidence in favor of the theory comes from questions about seat belt use. Both better and less educated people report believe that seat belts protect them in the case of an accident, but some less educated people also believe that a seat belt can harm them. Fewer better educated people believe this.[17]

[17] While this theory is promising, not all the evidence is consistent with it. Some researchers have shown video testimonials to men with prostate cancer, allowing them to make more informed choices about their treatment options. The impact of these videos is similar by education.

Whether this theory is right or another one, the question we raise is fundamentally important. Without understanding why health behaviors differ by education, we will never be able to significantly close the education gap in health.

Appendix: Data details and variable construction

Data Sets used

Dataset	Analysis Years	Samples
National Health Interview Survey (NHIS)	1990, 1991, 1992, 1994, 2000	Whites aged 25 and older.
National Longitudinal Survey of Youth 1979 (NLSY79)	1998, 2002	All respondents with non-missing dependent and independent variables.
National Survey of Midlife Development in the United States (MIDUS)	1995-1996	All respondents with non-missing dependent and independent variables.
Health and Retirement Survey (HRS)	Waves 2-5, corresponding to HRS '94, '96, '98, '00	All respondents who were aged 25 or older in Wave 1, interviewed in Waves 1-5 (proxy interviews were discarded), who had non-zero weights in each wave.

Construction of variables on knowledge of the harms of smoking and drinking

cig1know: cig1know is constructed from the following questions:

1. Tell me if you think cigarette smoking definitely increases, probably increases, probably does not increase, or definitely does not increase a person's chance of getting to following problems-
   a. Emphysema
   b. Bladder cancer
   c. Cancer of the larynx or voice box
   d. Cancer of the esophagus
   e. Chronic bronchitis
   f. Lung cancer

cig2know: cig2know is constructed from the following questions:

1. [asked if < 45 years old] Does cigarette smoking during pregnancy definitely increase, probably increase, probably not, or definitely not increase the chances of-
   a. Miscarriage
   b. Stillbirth
   c. Premature birth
   d. Low birth weight
2. [asked if < 45 years old] If a woman takes birth control pills, is she more likely to have a stroke if she smokes than if she does not smoke?

cigknowall: cigknowall is equal to one if age<45 and all cig1know & cig2know questions are correct and equal to 1 if age>=45 and all cig1know questions are correct.

drk1know: drk1know is constructed from the following questions:
1. Tell me if you think heavy alcohol drinking definitely increases, probably increases, probably does not increase, or definitely does not increase a person's chance of getting to following problems-
   a. throat cancer
   b. cirrhosis of the liver
   c. cancer of the mouth.

drk2know: drk2know is constructed from the following questions:
1. Does heavy drinking during pregnancy definitely increase, probably increase, probably not, or definitely not increase the chance of-
   a. Miscarriage
   b. mental retardation of the newborn
   c. low birth weight of the newborn
   d. birth defects.

drkknowall: drkknowall is equal to one if age <45 and all drk1know & drk2know questions are correct and equal to 1 if age>=45 and all drk1know questions are correct

Construction of Risk Aversion Measure (from HRS documentation)

R is asked if he/she would risk taking a new job, given that family income is guaranteed now. The new job offers a chance to increase income but also carries the risk of loss of income. If R says he/she would take the risk, the same scenario but with riskier odds is presented. If R says he/she would not take the risk, the same scenario with less risky odds is asked.

The question wording is: Now I have another kind of question. Suppose that you are the only income earner in the family, and you have a good job guaranteed to give you your current (family) income every year for life. You are given the opportunity to take a new and equally good job, with a 50-50 chance it will double your (family) income and a 50-50 chance that it will cut your (family) income by a third. Would you take the new job?

If yes, then: Suppose the chances were 50-50 that it would double your (family) income, and 50-50 that it would cut it in half. Would you still take the new job?

If no, then: Suppose the chances were 50-50 that it would double your (family) income and 50-50 that it would cut it by 20 percent. Would you then take the new job?

This variable is set using the following:
1. R takes first risk and second (more risky) job=1, least risk-averse.
2. R takes the first risk but not the second=2, 2nd least risk averse.
3. R doesn’t take the first risk but does take the second (less risky) job=3, 2nd most risk averse.
4. R takes neither risk=4, most risk averse.

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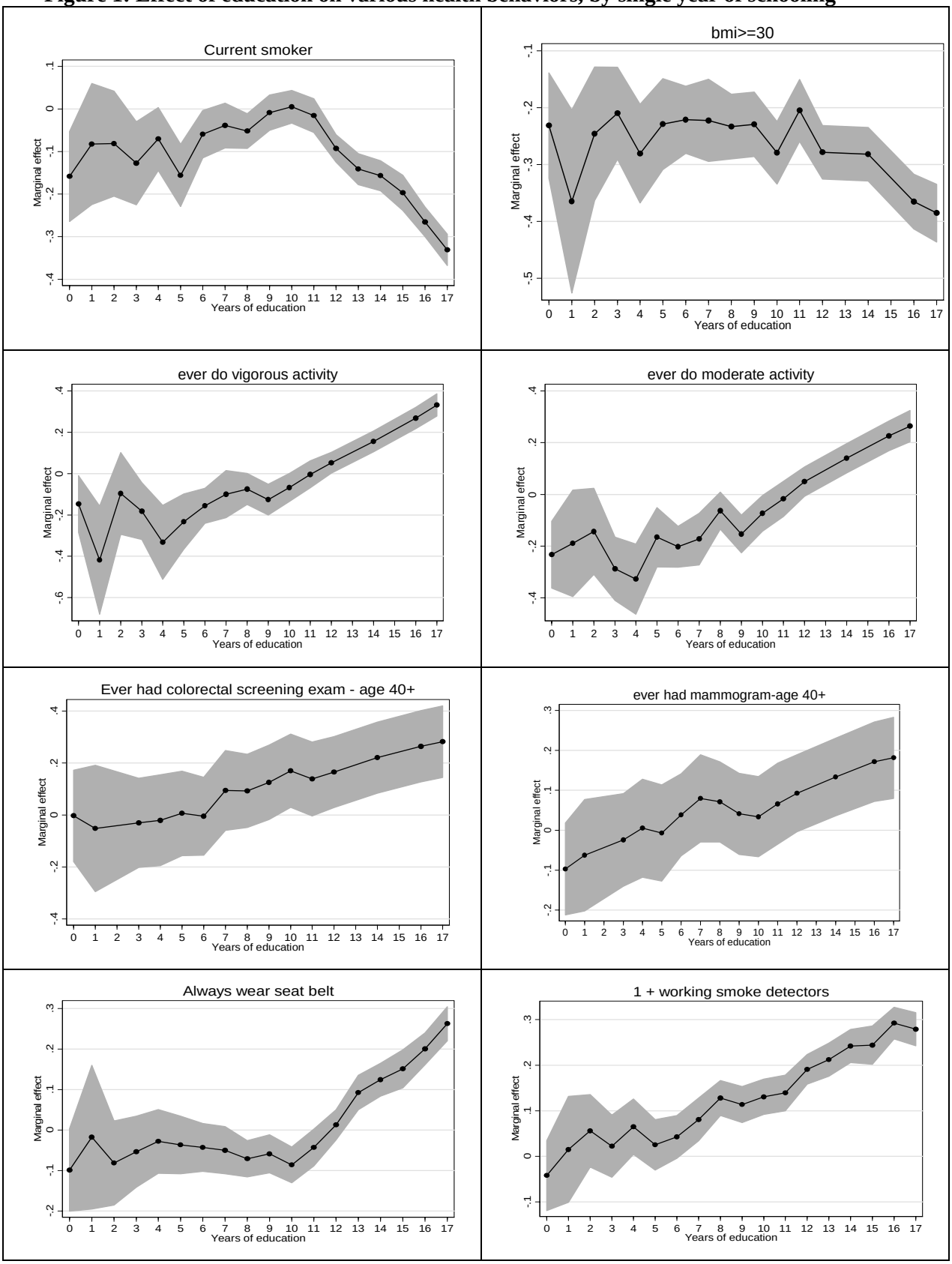
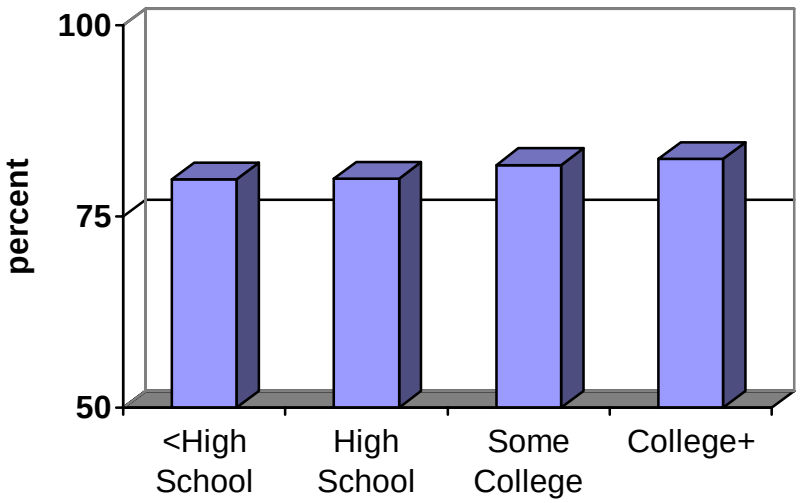
Figure 1: Effect of education on various health behaviors, by single year of schooling



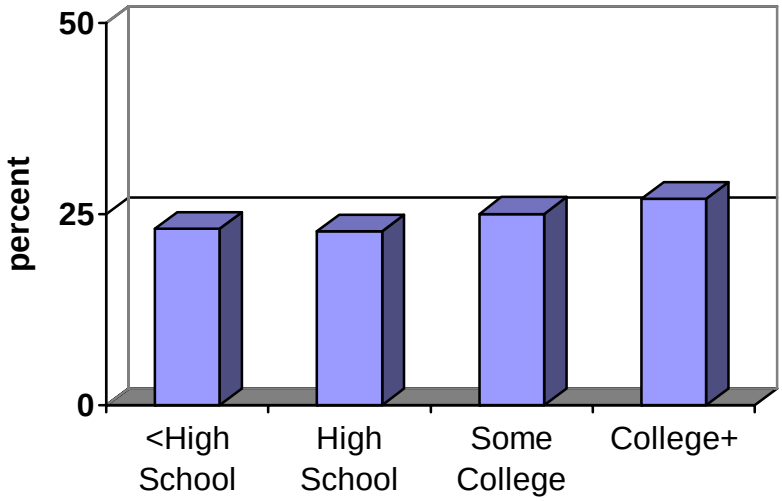
Note: Marginal effects from logit regressions on education, controlling for race and gender. The shaded areas are 95% confidence intervals for each coefficient. NEED TO ADD HEAVY DRINKING.

Figure 2: Intentions on quitting smoking

(a) Percent Wanting to Quit Smoking

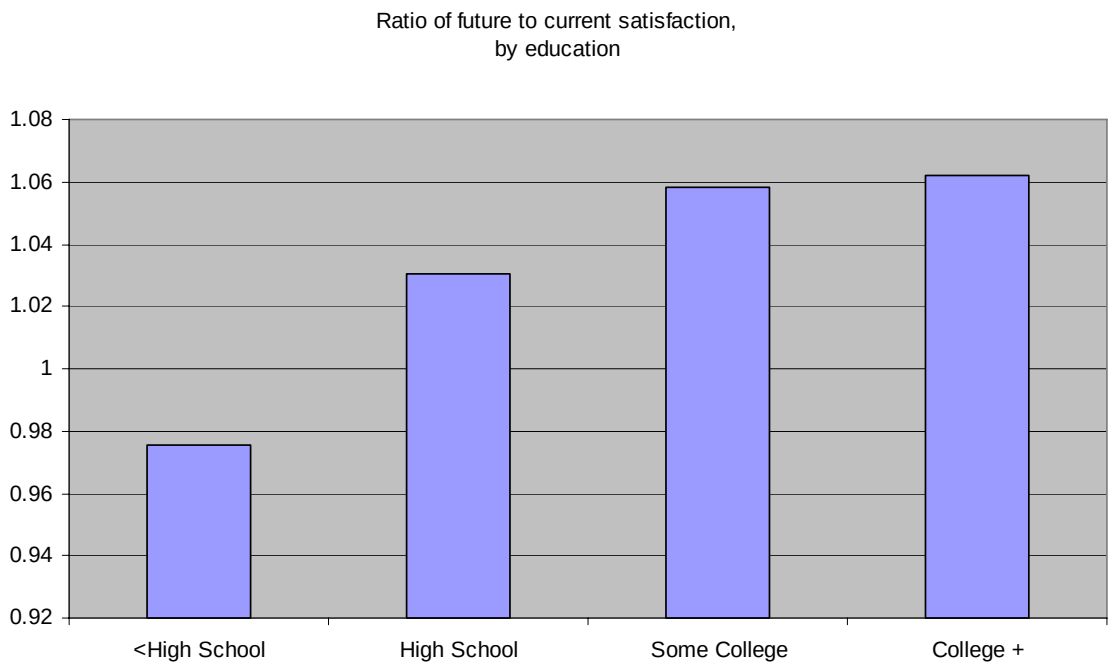


(b) Percent Planning to Quit in the Next 30 Days



Note: Data are from the NHIS.

Figure 3:



Note: Data are from the MIDUS survey.

Table 1: Health Behaviors for Whites over 25
National Health Interview Survey

			Demographic Controls			Adding Economic Controls				
Dependent Variable	Mean	Obs	Years of Education	std error		Years of Education	std error		Reduction in Ed Coeff.	Survey Year
Smoking										
Current smoker	0.23	22141	-0.0255	0.0010	**	-0.0200	0.0012	**	22%	2000
Ever a smoker	0.49	22156	-0.0190	0.0012	**	-0.0193	0.0014	**	-2%	2000
Number cigs a day (smokers)	17.73	4910	-0.4267	0.0682	**	-0.4438	0.0725	**	-4%	2000
Made serious attempt to quit °	0.64	7603	0.0150	0.0022	**	0.0108	0.0024	**	28%	1990
Diet/Exercise										
Body mass index (BMI)	26.73	21401	-0.2011	0.0135	**	-0.1390	0.0155	**	31%	2000
Overweight (bmi>=25)	0.59	21401	-0.0162	0.0012	**	-0.0127	0.0014	**	22%	2000
Obese (bmi>=30)	0.22	21401	-0.0137	0.0010	**	-0.0100	0.0012	**	27%	2000
How often eat fruit or veggies per day	1.90	22285	0.0738	0.0034	**	0.0672	0.0039	**	9%	2000
Ever do vigorous activity	0.39	22003	0.0410	0.0011	**	0.0284	0.0013	**	31%	2000
Ever do moderate activity	0.53	21768	0.0405	0.0012	**	0.0290	0.0014	**	28%	2000
Alcohol										
Number of days had 5+ drinks past year- all	6.83	21663	-0.7344	0.0874	**	-0.7628	0.1000	**	-4%	2000
Number of days had 5+ drinks past year- drinkers	10.78	13458	-1.8957	0.1511	**	-1.7544	0.1704	**	7%	2000
Had 12+ drinks in entire life	0.80	22054	0.0243	0.0010	**	0.0141	0.0011	**	42%	2000
Drink at least once per month	0.47	21803	0.0338	0.0012	**	0.0196	0.0014	**	42%	2000
Average # drinks on days drank	2.34	13600	-0.1689	0.0111	**	-0.1414	0.0126	**	16%	2000
Drove drunk past year °	0.11	17121	-0.0029	0.0009	**	-0.0046	0.0010	**	-59%	1990
Number of times drove drunk past year °	0.93	17121	-0.1188	0.0351	**	-0.1193	0.0396	**	0%	1990
Illegal Drugs										
Ever used marijuana °	0.48	13413	0.0207	0.0017	**	0.0089	0.0019	**	57%	1991
Used marijuana, past 12 months °	0.08	13413	0.0000	0.0009		-0.0022	0.0010	**	---	1991
Ever used cocaine °	0.16	13174	0.0065	0.0012	**	0.0003	0.0014		95%	1991
Used cocaine, past 12 months °	0.02	13174	0.0000	0.0004		-0.0006	0.0005		---	1991
Ever used any other illegal drug °	0.22	13370	0.0056	0.0014	**	0.0006	0.0016		89%	1991
Used other illegal drug, past 12 months °	0.05	13176	-0.0018	0.0007	**	-0.0018	0.0009	**	0%	1991
Household Safety										
Know poison control number °	0.65	6838	0.0431	0.0020	**	0.0266	0.0024	**	38%	1990
1 + working smoke detectors °	0.80	29021	0.0210	0.0008	**	0.0116	0.0009	**	45%	1990
House tested for radon °	0.04	28440	0.0074	0.0004	**	0.0053	0.0005	**	28%	1990
Home paint ever tested for lead °	0.04	9600	-0.0007	0.0007		-0.0006	0.0008		14%	1991
At least 1 hand gun in household	0.53	13650	0.0051	0.0018	**	0.0007	0.0019		86%	1994
At least 1 gun in unlocked place	0.61	13712	0.0060	0.0017	**	0.0078	0.0019	**	-30%	1994
At least 1 gun unloaded	0.16	13734	-0.0080	0.0013	**	-0.0062	0.0014	**	23%	1994
Some ammo stored w/ guns °	0.47	8174	-0.0063	0.0023	**	-0.0085	0.0024	**	-35%	1994
At least 1 gun unloaded or unlocked	0.66	13542	0.0043	0.0017	**	0.0072	0.0018	**	-67%	1994
Automobile Safety										
Always wear seat belt °	0.69	29993	0.0319	0.0009	**	0.0256	0.0010	**	20%	1990
Never wear seat belt °	0.09	29993	-0.0130	0.0006	**	-0.0109	0.0007	**	16%	1990

Table 1 (continued)

Dependent Variable	Mean	Obs	Demographic Controls Years of Education	std error		Adding Economic Controls Years of Education	std error		Reduction in Ed Coeff.	
Preventive Care-recommended population										
Ever had mammogram-age 40+	0.87	8169	0.0182	0.0014	**	0.0102	0.0016	**	44%	2000
Had mamogram w/in past 2 yrs	0.56	8100	0.0262	0.0021	**	0.0142	0.0023	**	46%	2000
Ever had pap smear test	0.97	11866	0.0111	0.0006	**	0.0094	0.0007	**	15%	2000
Had pap smear w/in past yr	0.62	11748	0.0281	0.0017	**	0.0150	0.0019	**	47%	2000
Ever had colorectal screening-age 40+	0.31	14302	0.0224	0.0013	**	0.0184	0.0015	**	18%	2000
Had colonoscopy w/in past yr	0.09	14259	0.0013	0.0009	**	0.0061	0.0010	**	-369%	2000
Ever been tested for hiv	0.30	20853	0.0115	0.0011	**	0.0112	0.0013	**	3%	2000
Had an std other than hiv/aids, past 5 y	0.02	11398	0.0006	0.0005		0.0005	0.0006		17%	2000
Had flu shot past 12 mo	0.32	22047	0.0168	0.0011	**	0.0129	0.0012	**	23%	2000
Ever had pneumonia vaccination	0.18	21705	0.0061	0.0008	**	0.0059	0.0009	**	3%	2000
Ever had hepatitis b vaccine	0.19	21118	0.0176	0.0010	**	0.0166	0.0011	**	6%	2000
Received all 3 hepatitis B shots	0.15	20848	0.0148	0.0009	**	0.0138	0.0010	**	7%	2000
Among Diabetics										
Are you now taking insulin	0.32	1442	0.0027	0.0040		-0.0033	0.0046		222%	2000
Are you now taking diabetic pills	0.66	1443	-0.0104	0.0040	**	-0.0036	0.0047		65%	2000
Hypertension										
Blood pressure high at last reading°	0.07	28373	-0.0052	0.0005	**	-0.0041	0.0006	**	21%	1990
Among hypertensives										
Still have high bp °	0.47	6899	-0.0113	0.0020	**	-0.0090	0.0023	**	20%	1990
High bp is cured (vs controlled) °	0.26	3537	0.0008	0.0025		-0.0018	0.0029		325%	1990

Notes: Sample sizes are constant across columns. Demographic controls include a full set of age dummies and gender. Economic controls include hispanic origin, family income, family size, major activity, region, MSA, marital status, and whether covered by health insurance. Outcomes marked with ° came from waves of the NHIS that did not collect health insurance data, so health insurance is not included in these regressions. Self reports are from questions of the form "Has a doctor ever told you that you have ...?" NHIS weights are used in all regressions and in calculating means.

Table 2: Potential Correlates of Education

Measure	All	<High School	High School	Some College	College +	Data, sample	Obs
Knowledge							
All smoking questions correct	26%	24%	25%	27%	30%	NHIS, white adults	30469
All drinking questions correct	30%	32%	29%	30%	32%	NHIS, white adults	30468
AFQT score	47.56	15.49	37.14	52.23	72.75	NLSY, ages 33-41	8028
Resources							
Mean income						NHIS, white adults	
Health insurance	89%	77%	88%	90%	96%	NHIS, white adults	22372
Utility Function Parameters							
Discounting							
Life satisfaction current	7.81	7.859	7.942	7.498	7.857	MIDUS, 40+	2001
Life satisfaction future	8.08	7.666	8.185	7.936	8.346	MIDUS, 40+	2001
Plan for the future	0.443	0.372	0.465	0.417	0.486	MIDUS, 40+	1978
Risk aversion	3.316	3.337	3.387	3.288	3.194	HRS	5217

Weights used in all means. Risk aversion- 1=least risk averse, 4=most risk averse

Table 3: The Impact of Knowledge on Health Behaviors
National Health Interview Survey

	Without Knowledge			With Knowledge Questions							
Dependent Variable	Years of Education	std error		Years of Education	std error		All Questions Correct	std error		Reduction in Education Coefficient	N
Smoking											
Current smoker	-0.0213	0.0010	**	-0.0204	0.0010	**	-0.0940	0.0055	**	4%	30172
Number cigs a day (smokers)	-0.3289	0.0462	**	-0.3307	0.0462	**	0.1800	0.2655		-1%	15496
Alcohol											
Drink at least once per month	0.0097	0.0009	**	0.0100	0.0009	**	-0.0389	0.0051	**	-3%	30111
Number drinks when drinks (drinkers)	-0.1047	0.0055	**	-0.1039	0.0055	**	-0.0954	0.0283	**	1%	13937

Notes: Data is from the 19XX NHIS. Sample sizes are constant across columns. Sample includes whites ages 25 and above with no missing values. All regressions include a full set of age dummies, gender, hispanic origin, family income, family size, major activity, region, MSA, and marital status. See tha data appendix for the construction of the knowledge indicators.

Table 4: The Impact of Knowledge on Health Behaviors
National Longitudinal Survey of Youth 1979

	Without AFQT			With AFQT							
Dependent Variable	years of education	std error		years of education	std error		AFQT	std error		Reduction in education coefficient	Obs	Mean
Smoking												
Current smoker	-0.0570	0.0030	**	-0.0461	0.0034	**	-0.0021	0.0003	**	19%	4337	0.25
Alcohol												
Current drinker	0.0068	0.0035	*	0.0003	0.0040		0.0013	0.0004	**	96%	4143	0.60
Frequency of heavy drinking	-0.1445	0.0209	**	-0.1228	0.0237	**	-0.0043	0.0022	*	15%	2366	0.97
Diet/Exercise												
BMI	-0.1244	0.0423	**	-0.1297	0.0480	**	0.0011	0.0045		-4%	4086	27.78
Vigorous exercise > 1 time / week	0.0276	0.0044	**	0.0276	0.0050	**	0.0000	0.0004		0%	3173	0.41
Light exercise > 1 time / week	0.0189	0.0038	**	0.0130	0.0042	**	0.0012	0.0037	**	31%	3174	0.78
Other												
Depression scale	-0.0960	0.0349	**	-0.0328	0.0395		-0.0123	0.0036	**	66%	2737	2.95
Read food labels	0.0358	0.0036	**	0.0235	0.0041	**	0.0024	0.0004	**	34%	4147	0.47
Poor self-reported heatlh	-0.0092	0.0018	**	-0.0073	0.0020	**	-0.0004	0.0002	**	21%	4147	0.38

Note: Data are from the 1998 (Current smoker, Vigorous exercise, Light exercise) and 2002 (Alcohol, BMI, Other questions) waves of the NLSY. Frequency of heavy drinking is asked for current drinkers. Includes controls for age, race, income, other demographics. NLSY weights are used for all regressions and weighting

Table 5: Discounting and the Value of the Future
National Survey of Midlife Development in the United States, 1995-1996

			Basic Demographics			Including Current and Future Life Satisfaction and Future Planning															
Dependent Variable	Mean	Obs	Years of Education	std error		Years of Education	std error		Plan for Future	std error		Life Satis. Current	std error		Life Satis. Future	std error		Plan * Fut Satis.	std error		Reduction in Education Coefficient
General Behavior																					
Work hard to stay healthy°	2.433	2969	0.0193	0.0145		0.0247	0.0144	*	-0.0908	0.0215	**	-0.0653	0.0295	**	-0.5909	0.3519	*	0.0392	0.0408		-28%
Effort put on health°°	7.2172	2969	0.0093	0.0213		-0.0023	0.0208		0.1469	0.035	**	0.1766	0.0374	**	0.9557	0.5034	*	-0.059	0.0581		125%
Health worse then men/women own age	0.0732	2952	-0.0045	0.003		-0.0041	0.0028		-0.0215	0.0049	**	-0.0059	0.0058		-0.0592	0.0733		0.0073	0.0083		9%
Smoking																					
Smoke now	0.2308	2968	-0.0319	0.0044	**	-0.0318	0.0044	**	-0.0137	0.0075	*	-0.0013	0.0086		-0.1467	0.0981		0.0164	0.0115		0%
Average # of cigs per day	25.7178	1577	-0.7825	0.2082	**	-0.7828	0.2079	**	-0.1705	0.3065		-0.9106	0.3643	**	-7.4315	4.7284		1.001	0.5508	*	0%
Ever tried to quit smoking (if smoker)	0.8204	685	0.003	0.0107		0.0022	0.0108		0.0116	0.0134		-0.0064	0.0159		-0.1344	0.2029		0.0206	0.0231		27%
Diet/Exercise																					
Lose 10 lbs due to lifestyle	0.3004	1561	-0.0002	0.007		-0.001	0.007		-0.0073	0.0103		0.005	0.0107		-0.0404	0.1285		0.0126	0.0153		-400%
Take vitamin at least few times per week	0.4931	2969	0.0145	0.0053	**	0.0144	0.0053	**	-0.0087	0.0081		-0.0014	0.0092		-0.2271	0.109	**	0.0281	0.0128	**	1%
Partake in moderate activity	0.3767	2997	-0.013	0.005	**	-0.0118	0.005	**	-0.0222	0.0074	**	-0.0232	0.0091	**	-0.1428	0.1077		0.0154	0.0125		9%
Partake in vigorous activity	0.5749	2997	-0.0088	0.005	*	-0.0074	0.005		-0.0118	0.0073		-0.0237	0.0074	**	-0.0834	0.0945		0.0038	0.0112		16%
Illegal Drugs																					
Any illegal drug used, past 12 months	0.1418	2934	-0.0079	0.0038	**	-0.0077	0.0038	**	-0.0226	0.0059	**	-0.0004	0.0066		-0.1469	0.0727	**	0.0172	0.0086	**	3%
Preventive Care°°°																					
Had blood pressure test in past yr	0.6703	2933	0.0059	0.0051		0.0066	0.0051		0.0019	0.0078		-0.0039	0.0084		-0.1486	0.1085		0.0105	0.0127		-12%
Rx meds for blood pressure, past 30 days	0.5834	749	0.0014	0.0081		0.0003	0.0081		0.006	0.0139		-0.0325	0.0127	**	0.2186	0.1427		-0.0229	0.0175		79%
Rx meds for high cholesterol, past 30 days	0.1529	471	0.0173	0.0096	*	0.0198	0.0097	**	0.0052	0.0127		-0.0084	0.013		0.2005	0.1744		-0.0212	0.021		-14%
Rx meds for a heart condition, past 30 days	0.3206	471	0.0135	0.0115		0.0163	0.0116		0.0146	0.0144		0.0033	0.0141		0.4253	0.208	**	-0.048	0.0256	*	-21%
Rx for nerves, anxiety, or depression, past 30 days	0.3374	827	-0.0109	0.0092		-0.0105	0.0092		0.0047	0.012		-0.0093	0.0123		0.0086	0.1681		-0.0019	0.0201		4%

Note: All regressions use survey weights. Regressions include controls for "Plan for the future" is coded as 1 if the respondent likes to plan for the future a lot, and 0 otherwise.
° Scale is from 1 to 7
°° Scale is from 0 to 10
°°° Questions are asked of those diagnosed with the chronic disease

ADD BMI REGRESSION
ADD list of controls

Table 6: Risk Aversion and Education Differences in Health, Health and Retirement Study

			Without Risk Aversion			With Risk Aversion										
									Level of Risk Aversion							Reduction in
									Lowest		Second		Third			Education
Dependent Variable	Obs	Mean	Years of Education	SE		Years of Education	SE		Coef	SE	Coef	SE	Coef	SE		Coefficient
Smoking																
Current smoker	20684	0.1988	-0.0171	0.0022	**	-0.0172	0.0022	**	0.049	0.0178	**	-0.0116	0.017	0.0192	0.0155	-0.6%
Drinking																
Current drinker	20814	0.5529	0.0229	0.0026	**	0.0224	0.0026	**	0.0289	0.0185		0.0404	0.0182	**	0.0571	0.0178	**	2.2%
Heavy drinker	20814	0.0181	-0.0027	0.0006	**	-0.0027	0.0006	**	0.0072	0.0051		-0.0011	0.0046		0.007	0.0045		0.0%
Diet/Exercise																
BMI	20614	27.2595	-0.1249	0.0289	**	-0.1232	0.0289	**	0.4693	0.2297	**	-0.081	0.2123	-0.3181	0.1996	1.4%
Vigorous activity 3+ times/week	20706	0.4401	0.002	0.0021		0.0021	0.0021		-0.0126	0.0158		0.0232	0.0157	-0.0116	0.0155	-5.0%
Preventive Care																
Got flu shot	10432	0.482	0.0114	0.0027	**	0.0114	0.0027	**	0.013	0.0199		0.0101	0.0203	0.0075	0.0187	0.0%
Got mammogram (women)	5727	0.748	0.0167	0.0035	**	0.0166	0.0034	**	-0.0194	0.0241		0.0149	0.0228	0.0192	0.0209	0.6%
Got pap smear (women)	5720	0.6825	0.0122	0.0036	**	0.012	0.0036	**	-0.014	0.0259		0.0522	0.0232	**	0.0227	0.022		1.6%
Got prostate test (men)	4697	0.7149	0.0228	0.0031	**	0.023	0.0031	**	-0.0372	0.0233		0.0122	0.0243	-0.0403	0.0249	-0.9%

Note: Data are from waves 2-5 of the HRS. For preventive care measures, data are available from only waves 3 and 5 for flu shot, mammogram, and prostate test; for pap smear, only data from waves 3-5 are available. Regressions are weighted using the person weights included in the HRS; standard errors are clustered at the person level. Regressions include a full set of age dummies; sex; ethnicity (=1 if hispanic); labor force status; region dummies; marital status; household income; household total assets; household size; mother's and father's education; mother's and father's religion; whether mother and father are alive; SES, health status, and father's occupation at age 16. Heavy drinking is defined by consuming 5+ drinks in one day. See Appendix A for the information on the measurement of risk aversion.

Table 7: Retirement and Education Differences in Health
Health and Retirement Study, Pooled Estimates

	No Retirement			No Fixed Effects								Fixed effects								
Dependent Variable	Yrs of Ed	SE		Yrs of Ed	SE		Retired	SE		Ed* Retired	SE		Retired	SE		Ed* Retired	SE		Obs	*N*	Mean
Smoking																					
Current smoker	-0.015	0.002	**	-0.015	0.002	**	-0.089	0.038	**	0.003	0.003		-0.0119	0.0217		0.0012	0.0017		21826	5509	0.1973
Drinking																					
Current drinker	0.030	0.002	**	0.029	0.002	**	0.094	0.048	**	0.000	0.004		-0.0417	0.0317		0.004	0.0024	*	21956	5509	0.5512
Heavy drinker	-0.003	0.001	**	-0.003	0.001	**	0.014	0.015		-0.001	0.001		-0.0015	0.014		0.0003	0.001		21956	5509	0.0187
Diet/Exercise																					
BMI	-0.133	0.023	**	-0.128	0.026	**	-0.068	0.508		-0.012	0.039		0.3329	0.2021	*	-0.027	0.0148	*	21753	5494	27.2485
Vigorous activity 3+/week	0.003	0.002	*	-0.001	0.002		-0.084	0.044	*	0.013	0.003	**	-0.1378	0.0472	**	0.0117	0.0036	**	21842	5509	0.4407
Preventive Care																					
Got flu shot	0.013	0.002	**	0.013	0.003	**	-0.073	0.054		0.002	0.004		0.0788	0.0635		-0.0029	0.0049		11001	5509	0.4784
Got mammogram (women)	0.019	0.003	**	0.019	0.003	**	0.025	0.071		0.000	0.005		0.1543	0.0857	**	-0.0112	0.0064	*	5892	2952	0.7466
Got pap smear (women)	0.018	0.003	**	0.017	0.003	**	0.035	0.076		-0.001	0.006		0.1455	0.1058		-0.0092	0.0082		5885	2952	0.6809
Got prostate test (men)	0.027	0.003	**	0.028	0.003	**	-0.031	0.067		0.000	0.005		0.0957	0.1013		-0.0088	0.0076		5100	2557	0.7129

Note: Data are from waves 2-5 of the HRS. For preventive care measures, data are available from only waves 3 and 5 for flu shot, mammogram, and prostate test; for pap smear, only data from waves 3-5 are available. Regressions are weighted using the person weights included in the HRS; standard errors are clustered at the person level. Regressions include a full set of age dummies; sex; ethnicity (=1 if hispanic); labor force status; region dummies; marital status; household income; household total assets; household size; mother's and father's education; mother's and father's religion; whether mother and father are alive; SES, health status, and father's occupation at age 16. Heavy drinking is defined by consuming 5+ drinks in one day. See Appendix A for the information on the measurement of risk aversion.

Table 8: Propensity to Follow Rules
National Survey of Midlife Development in the United States, 1995-1996

	Basic Demographics			Including Rules					
Dependent Variable	Years of Education	SE		Years of Education	SE		Reduction in Ed Coef	Obs	Mean
General Behavior									
Work hard to stay healthy°	0.0182	0.0152		0.0151	0.0153		17%	2669	2.4332
Effort put on health°°	0.0145	0.022		0.0182	0.0221		-26%	2669	7.2132
Health worse then men/women own age	-0.0048	0.0031		-0.0045	0.0031		6%	2653	0.0727
Smoking									
Smoke now	-0.0302	0.0046	**	-0.0299	0.0046	**	1%	2668	0.2196
Average # of cigs per day	-0.8076	0.2214	**	-0.8029	0.2237	**	1%	1410	25.7142
Ever tried to quit smoking (if smoker)	0.0071	0.0134		0.008	0.0134		-13%	586	0.8174
Diet/Exercise									
Lose 10 lbs due to lifestyle	-0.0009	0.0074		-0.0007	0.0074		22%	1421	0.2991
Take vitamin at least few times per week	0.0144	0.0056	**	0.0154	0.0056	**	-7%	2669	0.4908
Partake in moderate activity	-0.0111	0.0052	**	-0.0113	0.0052	**	-2%	2669	0.3717
Partake in vigorous activity	-0.0101	0.0053	*	-0.0105	0.0052	**	-4%	2669	0.5762
Illegal Drugs									
Any illegal drug used, past 12 months	-0.0082	0.004	**	-0.0086	0.0039	**	-5%	2640	0.1394
Preventive Care°°°									
Had blood pressure test in past yr	0.0061	0.0053		0.0066	0.0053		-8%	2636	0.6719
Rx meds for blood pressure, past 30 days	0.0027	0.0087		0.0026	0.0086		4%	664	0.5828
Rx meds for high cholesterol, past 30 days	0.0184	0.0108	*	0.0167	0.0113		9%	418	0.1507
Rx meds for a heart condition, past 30 days	0.0053	0.0122		0.0018	0.0127		66%	419	0.315
Rx for nerves, anxiety, or depression, past 30 days	-0.0146	0.0101		-0.0133	0.0102		9%	733	0.3452

Notes: The "Rules" specifications include indicator variables of how many rules the respondent has in his/her life, how strict the respondent's father was with rules in childhood, and how strict the respondent's mother was with rules in childhood. Options were "a little," "somewhat," and "a lot."

° Scale is from 1 to 7

°° Scale is from 0 to 10

°°° Questions are asked of those diagnosed with the chronic disease

Table 9: Probability of having quit smoking, among current or former smokers
National Health Interview Survey

Dependent variable: Whether respondent quit smoking.	Baseline	control for methods and number of times tried quitting	Add interactions with education
years of education	0.0190	0.0149	0.0203
	0.0016	0.0014	0.0029
# times quit smoking for 1+ day		-0.0008	-0.0014
		0.0001	0.0005
number of methods used to quit		-0.0083	-0.3882
		0.0804	0.5183
Methods used for quitting (switch to light cigarettes default category)			
stopped all at once		0.3972	0.8800
		0.0808	0.5199
gradually decreased # cigs smoked		0.1221	0.3425
		0.0823	0.5262
instructions in pamphlet/book		-0.0944	0.0431
		0.1173	0.7301
one-on-one counseling		-0.0006	0.0000
		0.1116	0.0000
stop-smoking clinic/program		0.1939	0.6670
		0.0914	0.5833
nicotine patch		0.0334	0.4921
		0.0824	0.5286
nicotine containing gum		0.0180	0.3096
		0.0861	0.5386
nicotine nasal spray		-0.2677	-0.1612
		0.2147	1.5557
nicotine inhaler		0.0000	0.5521
		0.0000	0.6645
zyban/buproprion/wellbutrin medication		-0.0223	0.7771
		0.0843	0.5379
switched to chewing tobacco/snuff		0.4189	0.9114
		0.1022	0.6253
any other method		0.2218	0.7295
		0.0843	0.5391
Interactions			
edX(number of times tried to quit)			0.0000
			0.0000
edX(nunmber of methods tried)			-0.0119
			0.0280
edyrs X stopped all at once			0.0045
			0.0281
edyrs X gradually decreased # cigs smoked			0.0228
			0.0286
edyrs X instructions in pamphlet/book			0.0283
			0.0431
edyrs X one-on-one counseling			0.0362
			0.0431
edyrs X stop-smoking clinic/program			0.0055
			0.0325
edyrs X nicotine patch			0.0063
			0.0293
edyrs X nicotine containing gum			0.0179
			0.0296
edyrs X nicotine nasal spray			0.0308
			0.1042
edyrs X nicotine inhaler			0.0000
			0.0000
edyrs X zyban/buproprion/wellbutrin med			-0.0171
			0.0294
edyrs X switched to chewing tobacco/snuff			0.0035
			0.0382
edyrs X any other method			0.0028
			0.0292
Observations	10807	10807	10807
R-squared	0.21	0.33	0.332
Mean	0.4993	0.4993	0.4993
Standard Deviation	0.5	0.5	0.5
Ftest (F) all ed interaction variables			1.7891215
Ftest (p) all ed interaction variables			0.03882564
Ftest (F) ed*method interaction vars			1.6892409
Ftest (p) ed*method interaction vars			0.06919587

Table 10: Worrying and Stress
National Survey of Midlife Development in the United States, 1995-1996

	Basic Demographics			Including Stress & Worry					
Dependent Variable	Years of Education	SE		Years of Education	SE		Obs	Mean	Reduction in Education Coefficient
General Behavior									
Work hard to stay healthy°	0.0097	0.0185		0.0099	0.0183		2103	2.506	-2%
Effort put on health°°	0.0331	0.0272		0.0337	0.027		2103	7.1324	-2%
Health worse then men/women own age	-0.0049	0.0033		-0.0042	0.0033		2091	0.0536	14%
Smoking									
Smoke now	-0.044	0.0053	**	-0.0448	0.0053	**	2102	0.2326	-2%
Average # of cigs per day	-0.9537	0.2529	**	-0.9416	0.2539	**	1086	25.36	1%
Ever tried to quit smoking (if smoker)	0.002	0.014		0.001	0.0141		489	0.82	50%
Diet/Exercise									
Lose 10 lbs due to lifestyle	-0.0067	0.0058		-0.0068	0.0058		2046	0.2234	-1%
Take vitamin at least few times per week	0.0151	0.0067	**	0.0148	0.0067	**	2103	0.485	2%
Partake in moderate activity	-0.0002	0.0004		-0.0002	0.0005		2103	0.0033	0%
Times/month engages in moderate activity	0.0898	0.061		0.0785	0.0614		2103	9.2242	13%
Partake in vigorous activity	0	0.0007		-0.0001	0.0007		2103	0.0033	
Times/month engages in vigorous activity	0.0556	0.0645		0.0521	0.0648		2103	6.3189	6%
Illegal Drugs									
Any illegal drug used, past 12 months	-0.0092	0.0052	*	-0.0095	0.0052	*	2079	0.1558	-3%
Preventive Care°°°									
Had blood pressure test in past yr	0.0059	0.0062		0.0059	0.0062		2082	0.6883	0%
Rx meds for blood pressure, past 30 days	0.0005	0.0036		0.0013	0.0037		2090	0.1282	-160%
Rx meds for high cholesterol, past 30 days	-0.0018	0.0028		-0.0016	0.0028		2086	0.0374	11%
Rx meds for a heart condition, past 30 days	-0.0014	0.0022		-0.0011	0.0022		2086	0.034	21%
Rx for nerves, anxiety, or depression, past 30 days	-0.0025	0.0033		-0.0015	0.0033		2088	0.0891	40%

Notes: The stress/worry specification includes an indicator for whether the respondent worries somewhat or a lot, as well as indicators for whether the respondent reported any or all of the following circumstances: ongoing stress at work, jobs stress leading to irritability at home all or most of time, home stress leading to irritability at work all or most of time.

Table 11: Measures of self esteem, control and depression
National Longitudinal Survey of Youth

				Reduction in Ed Coefficient			
	Basic Controls	More Controls	Personality	More controls	All controls	Mean	Survey year
Smoking							
Currently smokes daily	-0.055**	-0.044**	-0.038**	20%	31%	0.24	1998
	[0.003]	[0.004]	[0.004]				
Alcohol							
Had alcoholic beverage last month	0.022**	-0.001	0	105%	100%	0.58	2002
	[0.003]	[0.004]	[0.004]				
If drank last month:							
Frequency more than 6 drinks	-0.160**	-0.117**	-0.104**	27%	35%	0.98	2002
	[0.019]	[0.025]	[0.025]				
Diet/Exercise							
BMI	-0.263**	-0.192**	-0.206**	27%	22%	27.57	1998
	[0.037]	[0.053]	[0.054]				
Light exercise more than once a week	0.026**	0.013**	0.011**	50%	58%	0.77	1998
	[0.003]	[0.005]	[0.005]				
Vigorous exercise + than once a week	0.041**	0.032**	0.032**	22%	22%	0.40	1998
	[0.004]	[0.006]	[0.006]				
Other							
CESD-short	-0.219**	-0.041	0.015	81%	107%	3.56	2002
	[0.031]	[0.040]	[0.038]				
Read food labels	0.038**	0.024**	0.022**	37%	42%	0.45	2002
	[0.003]	[0.004]	[0.004]				
Poor Health-Self report	-0.018**	-0.011**	-0.008**	39%	56%	0.10	2002
	[0.002]	[0.003]	[0.003]				

Notes: All regressions use survey weights
Basic controls: gender, race, age dummies, region dummies

More controls: income, marital status, family size, urban status, whether born in US, whether mom born US, whether dad born US, family income in 1979, mother's education, father's education, AFQT score 1979, whether lived with dad in 1979, height

Personality traits: rosen self esteem score in 1980 and in 1987, Pearlin score in 1992, rotter scale 1979, whether considered self shy at age 6 and as an adult (in 1985), depression history (CESD 92 and 94), had tried pot in 79, had damaged property in 1979, fought in school 79, had been charged with a crime by 1980.
Rotter Scale: extent of control over own life
Rosenberg: self esteerm
Pearlin self control
Reads food labels: read nutritional labels always of often when buy food for the first fime

Appendix Table 1: The Impact of Education and Always Wearing Seatbelt on Health Behaviors- Whites Age 25 and Older
National Health Interview Survey

	Without Seatbelt Question			With Seatbelt Question						
Dependent Variable	Years of Education	std error		Years of Education	std error		Always wear Seatbelt	std error		Reduction in Ed Coef
Smoking										
Current Smoker	-0.0247	0.0009	**	-0.0215	0.0009	**	-0.1018	0.0054	**	13%
Ever Smoked	-0.0171	0.0010	**	-0.0149	0.0010	**	-0.0712	0.0062	**	13%
Number cigs a day (smokers)	-0.2054	0.0415	**	-0.1446	0.0420	**	-2.0712	0.2396	**	30%
Made serious attempt to quit	0.0149	0.0022	**	0.0138	0.0022	**	0.0433	0.0113	**	7%
Alcohol										
Drink at least once per month	0.0216	0.0008	**	0.0220	0.0009	**	-0.0099	0.0053		-1%
Abstains from drinking	-0.0160	0.0007	**	-0.0160	0.0007		0.0005	0.0043		0%
Number drinks when drinks (drinkers)	-0.1254	0.0049	**	-0.1100	0.0049	**	-0.3923	0.0282	**	12%
Diet / Exercise										
BMI	-0.1946	0.0103	**	-0.1734	0.0104	**	-0.6624	0.0640	**	11%
Exercise or play sports regularly	0.0360	0.0010	**	0.0326	0.0010	**	0.1071	0.0061	**	10%
Health Screening										
Ever had a breast exam	0.0106	0.0006	**	0.0101	0.0006	**	0.0163	0.0037	**	5%
Had breast exam in last 2 years	0.0200	0.0011	**	0.0180	0.0011	**	0.0649	0.0068	**	10%
Ever had a mammogram	0.0306	0.0015	**	0.0282	0.0015	**	0.0874	0.0096	**	8%
Had mammogram past 2 years	0.0299	0.0016	**	0.0271	0.0016	**	0.1013	0.0099	**	9%
Ever had a pap smear	0.0075	0.0005	**	0.0071	0.0006	**	0.0132	0.0034	**	5%
Had pap smear in last year	0.0220	0.0013	**	0.0194	0.0013	**	0.0858	0.0082	**	12%

Notes: Sample sizes are constant across columns. All regressions include a full set of age dummies, gender.

Appendix Table 2: The Impact of Education, Depression, and Anxiety on Health Behaviors- Whites Age 25 and Older
National Health Interview Survey

	Education Only			With Depression and Anxiety Questions										
Dependent Variable	Years of Education	std error		Years of Education	std error		Depression Scale	std error		Anxiety	std error		Reduction in Ed Coef	N
Smoking														
Current Smoker	-0.0254	0.0010	**	-0.0233	0.0010	**	0.0087	0.0014	**	0.0197	0.0021	**	8%	22284
Ever Smoked	-0.0191	0.0012	**	-0.0173	0.0012	**	0.0056	0.0017	**	0.0213	0.0025	**	9%	22299
Number cigs a day (smokers)	-0.4121	0.0680	**	-0.3519	0.0678	**	0.2404	0.0716	**	0.5377	0.1079	**	15%	4941
Alcohol														
Drink at least once per month	0.0338	0.0012	**	0.0325	0.0012	**	-0.0124	0.0016	**	0.0073	0.0024	**	4%	21940
Abstains from drinking	-0.0242	0.0010	**	-0.0242	0.0010	**	0.0072	0.0013	**	-0.0199	0.0020	**	0%	22130
Ever had more than 12 drinks in one year	0.0293	0.0011	**	0.0289	0.0012	**	-0.0098	0.0016	**	0.0164	0.0023	**	2%	22189
Had 12+ drinks in entire life	0.0241	0.0010	**	0.0242	0.0010	**	-0.0070	0.0013	**	0.0195	0.0019	**	0%	22197
Number drinks when drinks (drinkers)	-0.1692	0.0110	**	-0.1573	0.0011	**	0.0753	0.0147	**	0.0686	0.0205	**	7%	13673
Number of days had 5+ drinks in past year	-1.8883	0.1505	**	-1.7309	0.1514	**	1.0914	0.2005	**	0.6576	0.2798	*	8%	13532
Diet / Exercise														
BMI	-0.2006	0.0135	**	-0.1848	0.0136	**	0.0980	0.0184	**	0.0568	0.0272	*	8%	21535
Ever do vigorous activity	0.0409	0.0011	**	0.0397	0.0012	**	-0.0149	0.0016	**	0.0166	0.0023	**	3%	22147
Ever do moderate activity	0.0405	0.0012	**	0.0391	0.0012	**	-0.0205	0.0017	**	0.0270	0.0025	**	3%	21911
How often eat fruits/vegetables in one day	0.0736	0.0034	**	0.0686	0.0034	**	-0.0502	0.0046	**	0.0342	0.0068	**	7%	22439
Health Screening														
Ever had a mammogram	0.0182	0.0014	**	0.0183	0.0014	**	-0.0019	0.0018		0.0053	0.0027	*	-1%	8221
Had mammogram past 2 years	0.0262	0.0021	**	0.0243	0.0021	**	-0.0090	0.0027	**	-0.0030	0.0040		7%	8151
Ever had a pap smear	0.0111	0.0006	**	0.0113	0.0006	**	0.0005	0.0008		0.0028	0.0012	*	-3%	11934
Had pap smear in last year	0.0284	0.0017	**	0.0271	0.0017	**	-0.0080	0.0022	**	0.0012	0.0032		4%	11812
Ever had colorectal screening	0.0224	0.0013	**	0.0240	0.0013	**	0.0037	0.0018	*	0.0157	0.0028	**	-7%	14397
Had colorectal screening in last year	0.0073	0.0009	**	0.0079	0.0009	**	0.0003	0.0012		0.0078	0.0018	**	-8%	14353
Ever had HIV test	0.0115	0.0011	**	0.0131	0.0011	**	0.0064	0.0015	**	0.0175	0.0023	**	-14%	20979
Had flu shot in last year	0.0168	0.0011	**	0.0171	0.0011	**	-0.0008	0.0015		0.0091	0.0022	**	-2%	22194
Ever had pneumonia vaccine	0.0061	0.0008	**	0.0070	0.0008	**	0.0022	0.0011	*	0.0132	0.0017	**	-15%	21845
Ever had Hepatitis B vaccine	0.0176	0.0010	**	0.0177	0.0010	**	-0.0010	0.0013		0.0056	0.0020	**	-1%	21249
Had all 3 Hepatitis B vaccines	0.0148	0.0009	**	0.0148	0.0009	**	-0.0011	0.0012		0.0029	0.0018		0%	20978

Notes: Sample sizes are constant across columns. All regressions include a full set of age dummies, gender. Note: # of drinks when drinks in this table is on a different scale than in Table 3.