A Dynamic Model of Health, Addiction, Education, and Wealth
Web Appendix

Rong Hai and James J. Heckman

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A Data and Basic Analysis

Table A1: Sample Selection

	Observations Left
Total person years for all individuals	124,099
Keep if male	62,620
Keep if white	30,925
Drop if ever in military service	27,576
Drop if age < 16	25,106
Drop if missing schooling or smoking information for the entire sample period	25,104

A.1 Variables Used

We discuss the definition of each variable we use.

Unhealthy Behavior

In this paper, unhealthy behavior means smoking every day (also called "regular smoking"). Every year, the NLSY97 asks respondents the following two questions on smoking behavior: "During the past 30 days, on how many days did you smoke a cigarette," and "When you smoked a cigarette during the past 30 days, how many cigarettes did you usually smoke per day."[1] We create an indicator variable of unhealthy behavior that equals 1 if an individual smokes every day and at least 1 cigarettes per day.

Measures of Health

We use three types of measures of health. The first measure is self-reported health status, where the respondent is asked "in general, how is your health," and the answers include: poor, fair, good, very good, and excellent. The second measure is a variable indicating the presence of at least one chronic health condition or mental condition. In 2002, 2007, 2008, 2009, the NLSY97 asks respondents about various chronic health conditions and mental/emotional/eating disorders, as well as the age at which the conditions were first diagnosed. Chronic health condition includes cardiovascular condition, heart condition, asthma, anemia, diabetes, cancer, and epilepsy; mental condition includes mental/emotional problems and eating disorders. We construct the an indicator of chronic health condition and mental condition based on whether the respondent had any of these conditions when aged 16 or younger using information on the first age the individual was diagnosed with each of these conditions. Our third measure of health is an individual's height at age 16. Height has been used widely as an indicator in part of childhood health.[2]

[1] Figure A1 plots the frequency distribution of days smoking and the average number of cigarettes per day.

[2] For example, see Robert (1986), Steckel (1995), Cutler and Lleras-Muney (2010), and Huang, Lei, Ridder, Strauss, and Zhao (2013).

Measures of Cognitive Ability and Noncognitive Ability

We use four scores from the Armed Services Vocational Aptitude Battery (ASVAB) as measures of cognitive ability.[3] Specifically, we consider the scores from Mathematical Knowledge (MK), Arithmetic Reasoning (AR), Word Knowledge (WK), and Paragraph Comprehension (PC). These four scores have been used by NLSY staff to create the Armed Forces Qualification Test (AFQT) score, which has been used commonly in the literature as a measure of IQ or cognitive ability.[4] We normalize these four sets of scores to be mean zero and standard deviation of one.

Our measures of noncognitive ability include three variables that indicate respondents' adverse behaviors at very early ages. Specifically, we use violent behavior in 1997 (ever attack anyone with the intention of hurting or fighting), theft behavior in 1997 (ever steal something worth $50 or more), and any sexual intercourse before age 15. Individuals with high noncognitive ability are less likely to display adverse behaviors.[5]

Youths' Education, Labor Market Outcomes, and Net Worth

Education is measured by the highest grade completed. We manually recode this variable by cross-checking the highest grade completed with data on enrollment and the highest degree received, to correct for missing data, data coding errors, and GEDs. In particular, a high school dropout with a GED is recoded to his highest grade of school actually completed.

The NLSY97 records individual earnings. The NLSY97 collects detailed information on assets and debts of respondents at ages 20, 25, and 30. We define net worth as all assets (including housing assets and all financial assets) minus all debt (including mortgages and all other debts).[6]

Parental Education, Net Worth, and Transfers

NLSY97 asks each respondent about their parents' schooling and net worth information only in round 1 (1997). We define parents' education as the average years of schooling of father and mother if information on both the father's and mother's schooling are available.[7] For single-parent families where only one parent's schooling level is available, we define the parents' schooling only using the single parent's schooling level. Parents' net worth is defined to include all assets (including housing assets and all financial assets) minus all debt (including mortgages and all other debts). Parental transfer data are constructed as total

[3]The CAT-ASVAB is an automated computerized test developed by the United States Military which measures overall aptitude. The test is composed of 12 subsections and has been well-researched for its ability to accurately capture a test-takers aptitude.

[4]From the summer of 1997 through the spring of 1998, most NLSY97 round 1 respondents participated in the administration of the computer-adaptive form of the Armed Services Vocational Aptitude Battery (CAT-ASVAB).

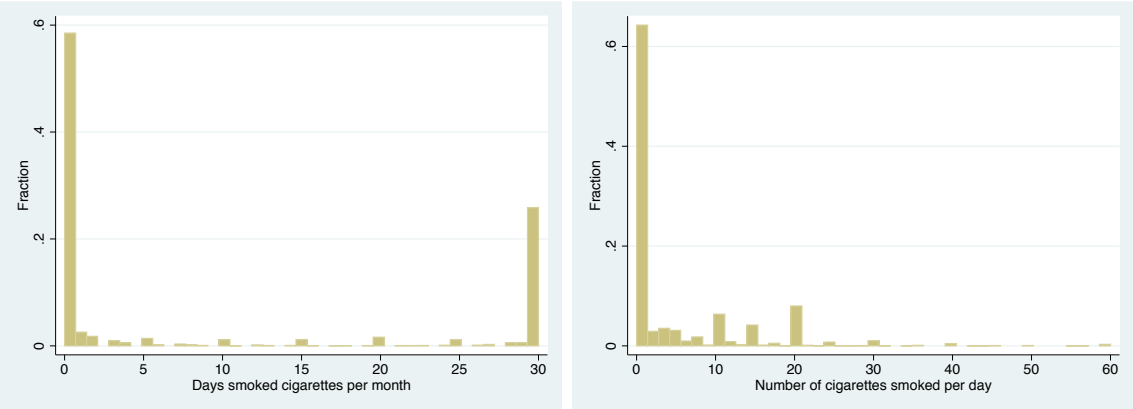
[5]See Heckman and Kautz, 2014 and Kautz and Zanoni, 2015 for discussions of the validity of these measures.

[6]We bottom-code the net worth to be -$75,000 and top-code the net worth to be $100,000. In Johnson (2013), asset values are top coded at $45,000 and bottom coded at -$35,000 for NLSY97 males aged 18 to 26.

[7]We top-code parents years of schooling to be 16 years (4-year college graduate) and bottom code parents schooling to be eight years (high school dropouts).

monetary transfers received from parents in each year, including allowance, non-allowance income, college financial aid gift, and inheritance.[8]

Figure A1: Smoking



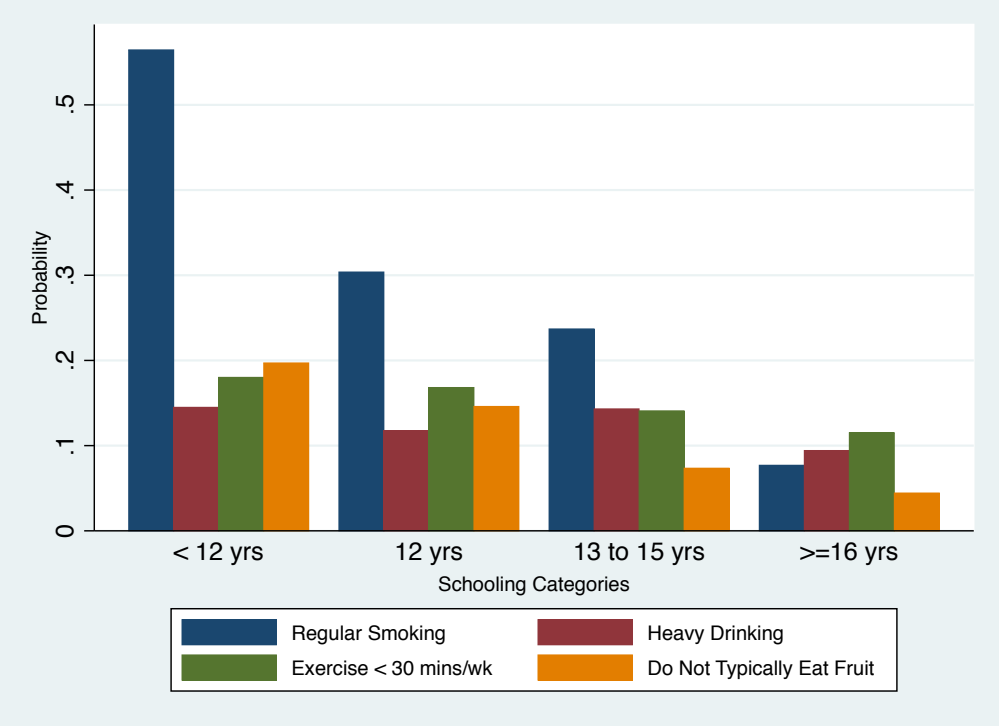
Source: NLSY97 white males.

Table A2: Cross-Correlation Table

Variables	Regular Smoking	Heavy Drinking	Exercise < 30 mins/wk	Do Not Typically Eat Fruit
Regular Smoking	1.000			
Heavy Drinking	0.136	1.000		
	(0.000)			
Exercise < 30 mins/wk	0.107	0.003	1.000	
	(0.000)	(0.773)		
Do Not Typically Eat Fruit	0.140	0.052	0.158	1.000
	(0.000)	(0.000)	(0.000)	

[8]College financial aid gift includes any financial aid respondents received from relatives and friends that are not expected to be paid back for each college and term attended in each school year.

Figure A2: Education Gradient in Various Health Behaviors

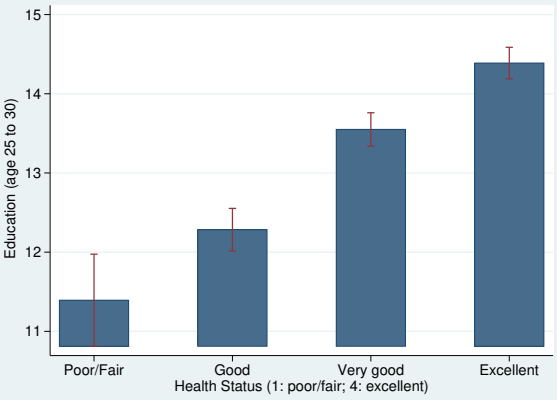


Source: NLSY97 white males aged 25 to 30. We create a dummy variable for heavy drinking based on commonly used measures, including the Center for Disease Control and Prevention (CDC) which defines heavy drinking as more than 2 drinks per day for men, and 1 drink per day for women. We modified this to be an average of 3 drinks or more per day, or 90 drinks per month.

Table A3: Education Gradient in Health, Smoking, Earnings, and Net Worth (age 30)

	HS Dropouts	HS Graduates	p-value of Diff
Health Status	2.45	2.55	0.39
Smoking Every Day	0.55	0.28	0.00
Earnings (in Thousands)	24.50	32.59	0.06
Net Worth (in Thousands)	14.30	30.58	0.00

(a) Education & Initial Health



(b) Net Worth & Initial Health

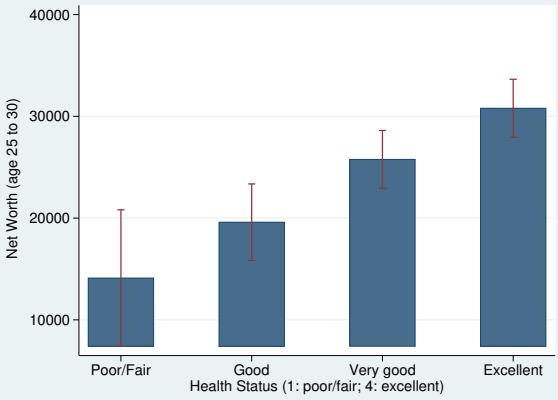


Figure A4: Initial Health and Education and Net Worth

B Model Parameterization

As describe in Section 2.1.5, earnings at age t depends on health, education, experience, as well as cognitive and noncognitive abilities:

$$y_t(d_{e,t}, d_{p,t}, \Omega_t) = \begin{cases} F^{\psi}(h_t, e_t, k_t, \boldsymbol{\theta}, \epsilon_{y,t}) & \text{if } d_{e,t} = 0, \\ d_{p,t} \cdot F^{\psi}(h_t, e_t, k_t, \boldsymbol{\theta}, \epsilon_{y,t}) \cdot \exp(\beta_{w,p}) & \text{if } d_{e,t} = 1 \end{cases}$$

where $\epsilon_{y,t} (\geq \underline{\epsilon}_y)$ is an idiosyncratic earnings shock at age t and k_t is the individual's age-t work experience since leaving school given by $k_t = \min(t - t_0, \max(0, t - 6 - e_t))$.

$F^{\psi}(h_t, e_t, k_t, \boldsymbol{\theta}, \epsilon_{y,t})$ is given by the following function:

$$\begin{aligned} \log F^{\psi}(h_t, e_t, k_t, \boldsymbol{\theta}, \epsilon_{y,t}) =& \beta_{\psi,h} \log(h_t + 1) + (\beta_{\psi,k,0} + \beta_{\psi,k,1}\mathbf{1}(e_t \geq 16))k_t + \beta_{\psi,kk}k_t^2 \\ &+ \beta_{\psi,e,0}(e_t - 12) + \beta_{w,e,1}\mathbf{1}(e_t \geq 12 \ \& \ e_t < 14) \\ &+ \beta_{w,e,2}\mathbf{1}(e_t \geq 14 \ \& \ e_t < 16) + \beta_{w,e,3}\mathbf{1}(e_t \geq 16) \\ &+ (\alpha_{\psi,c,1}\theta_c + \alpha_{\psi,n,1}\theta_n)\mathbf{1}(e_t < 12) \\ &+ (\alpha_{\psi,c,2}\theta_c + \alpha_{\psi,n,2}\theta_n)\mathbf{1}(e_t \geq 12 \ \& \ e_t < 16) \\ &+ (\alpha_{\psi,c,3}\theta_c + \alpha_{\psi,n,3}\theta_n)\mathbf{1}(e_t \geq 16) \\ &+ \beta_{\psi,t}(18 - t)\mathbf{1}(t < 18) + \beta_{\psi,0} + \log(\epsilon_{y,t}/\mathbb{E}(\epsilon_{y,t})) \end{aligned} \tag{1}$$

where $\epsilon_{y,t} \geq \underline{\epsilon}_y > 0$ is an idiosyncratic earnings shock at age t and $\mathbb{E}(\epsilon_{y,t})$ denotes the expected mean value of $\epsilon_{y,t}$. Without loss of generality, we normalize the lowest possible value of $\epsilon_{w,t}$ to be 1: $\underline{\epsilon}_w = 1$. We assume that the productivity shock $\epsilon_{w,t} - 1 \geq 0$ is drawn from a gamma distribution $Gamma(a, b)$, where a is the shape parameter and b is the scale parameter. The gamma distribution allows us to flexibly model both the shape and the scale of the productivity shock distribution which are governed by the parameters a and b, respectively.[9]

The flow utility from unhealthy goods consumption and from enrolling in school are given is specified as follows :

$$\begin{aligned} u_q =& \nu_{q,q}q_t + \nu_{q,h}h_t + \nu_{q,qh}q_t h_t + \nu_{q,e}(e_t - 9) + \nu_{q,c}\theta_c + \nu_{q,n}\theta_n + \nu_{q,0} - \epsilon_{q,t} \\ u_e =& \nu_{e,h}h_t + \nu_{e,c}\theta_c + \nu_{e,n}\theta_n + \nu_{e,p}\mathbf{1}(e_p > 12) - \nu_{e,e}(1 - d^e_{t-1}) \\ &+ \nu_{e,0}\mathbf{1}(d_{e,t} + e_t \leq 12) + \nu_{e,1}\mathbf{1}(d_{e,t} + e_t \geq 13 \ \& \ d_{e,t} + e_t \leq 16) \\ &+ \nu_{e,2}\mathbf{1}(d_{e,t} + e_t \geq 15 \ \& \ d_{e,t} + e_t \leq 16) + \nu_{e,3}\mathbf{1}(d_{e,t} + e_t > 16) \\ &+ \nu_{e,a}\mathbf{1}(t > 23) + (\nu_{e,k0}(t < 18) + \nu_{e,k1}(t \geq 18)) \cdot d_{p,t} - \epsilon_{e,t} \end{aligned}$$

Recall that all preference shocks are mutually independent and are normally distributed. The subjective discount factor $\delta(\boldsymbol{\theta}, h_t) \in (0, 1)$ takes the following functional form: $\delta(\boldsymbol{\theta}, h_t) = \exp(\delta_0 + \delta_c\theta_c + \delta_n\theta_n + \delta_h \log(h))/(1.0 + \exp(\delta_0 + \delta_c\theta_c + \delta_n\theta_n + \delta_h \log(h)))$.

[9] Chatterjee, Corbae, Nakajima, and Ríos-Rull (2007) assume that the distribution function of $\epsilon_{w,t}$ is characterized by a one-parameter distribution function: $Prob(\epsilon_w \leq z) = \left(\frac{z - \underline{\epsilon}_w}{\bar{\epsilon}_w - \underline{\epsilon}_w}\right)^{\phi_w}$, where ϕ_w controls the shape of the shock distribution and $\bar{\epsilon}_w$ is the upper bound of the shock. Our specification is more flexible.

C External Calibration

We calculate the cost of college tuition and fees and grants and scholarships from the following two sources: (i) Total direct expenditures (including tuition and fees) of higher education level e_t are calculated as the average expenditures per student using data from The Integrated Postsecondary Education Data System (IPEDS); (ii) We also calculate the average amount of the grant for each education level associated with every parental net worth tercile using the NLSY97 sample. We also obtain the average cost of college room and board from Johnson (2013) for two-year college and four-year college, respectively.

The government transfer function is given by $tr_{g,t} = \underline{c} \cdot \mathbf{1}((1 + r(s_t))s_t + y_t \leq \underline{c})$, which indicates that an household will receive a consumption subsidy of $\underline{c}$ per capita if the household's own financial resources is below the supported consumption level. In 2004, the food stamp benefit per capita is \$1020 annually, hence we set the government in-kind benefit to be \$1020 per capita. We set the borrowing interest rate equal to 5 percent annually. We set the lending interest rate r_l to be 2 percent annually.

We estimate the parental monetary transfers, $tr_{p,t}$ using our NLSY97 sample; the specification and parameter estimates are reported in Web Appendix Table C5. In the sample, 94% of youth who are attending high school live with their parents.[10] Following Kaplan (2012) and Johnson (2013), we set the consumption subsidy provided by parents for those who are living with their parents, χ, to be \$650 monthly (\$7800 annually)[11]; χ includes both the direct and indirect costs of housing as well as shared meals.

Using CPS 2017 data, we calculate the social security income to be \$9125.378 for high school dropouts (in 2004 dollars), \$11200.89 for high school graduates, \$11325.07 for individuals with some college degree, \$11232.91 for 4-year college graduates, and \$11590.56 for those with graduate degree.

[10] The ratio is 42% for those who are not attending high school.

[11] Our model abstracts away from multiple children in a household.

Table C4: Parameters and Functions Set Outside the Structural Model

Description	Parameter	Value	Source
Direct Cost of Unhealthy Behavior	p_q	\$1095	a pack of cigarettes \$4.0
College Tuition & Fees	$tc(e = 13, 14)$ $tc(e \geq 15)$	\$5,073 \$10,653	IPEDS data on average tuition and fees 1999-2006.
College Grants and Scholarship	$gr(e = 13, 14, s_p = T1)$ $gr(e = 13, 14, s_p = T2)$ $gr(e = 13, 14, s_p = T3)$ $gr(e \geq 15, s_p = T1)$ $gr(e \geq 15, s_p = T2)$ $gr(e \geq 15, s_p = T3)$	\$2,581 \$2,287 \$2,476 \$3,604 \$2,569 \$2,607	NLSY97 data on average grants and scholarship by years of schooling and parental wealth terciles.
College Room and Board	$tr(e = 13, 14)$ $tr(e \geq 15)$	\$4,539 \$6,532	Johnson (2013) room and board for 2-year college and 4-year college
GSL Borrowing Flow Annual	$\bar{l}^g(e = 13)$ $\bar{l}^g(e = 14)$ $\bar{l}^g(e = 15, 16)$ $\bar{l}^g(e > 16)$	\$2,625 \$3,500 \$5,500 \$10,500	Annual Stafford loan limits 1993 to 2007
GSL Borrowing Aggregate Limit	$\overline{L}^g(e_t \geq 13 \ \& \ e_t \leq 16)$ $\overline{L}^g(e_t \geq 16)$	\$23,000 \$138,500	Undergraduate Graduate + Undergraduate
Borrowing Interest Rate Lending Interest Rate	r_b r_l	5% 2%	Federal Student Aid Average real interest rate on 1-year U.S. government bonds
Government In-kind Benefit	$tr_{g,t} = \underline{c} \cdot \mathbf{1}((1+r(s_t))s_t + y_t \leq \underline{c})$	$\underline{c} =$ \$1020	2004 Food stamp benefit per capita
Parental Transfer Function	$tr_p(e_p, s_p, d_{e,t}, \boldsymbol{\theta}, e_t, t, \epsilon_{p,t})$	Table C5	NLSY97 sample
Parents Consumption Subsidy	$tr_{c,t} = \chi$ if $t < 18$ or $d_{e,t} = 1 \ \& \ e_t < 12)$	$\chi =$ \$7800	Kaplan (2012) & Johnson (2013)
Life Expectancy at age 65	$\overline{T}(e < 12)$ $\overline{T}(e = 12)$ $\overline{T}(e > 12, < 16)$ $\overline{T}(e = 16)$ $\overline{T}(e > 16)$	79 82 82 86 87	CDC Vital and Health Statistics, Series 2, Number 151
Social Security Income after age 64	$y^R(e < 12)$ $y^R(e = 12)$ $y^R(e > 12, < 16)$ $y^R(e = 16)$ $y^R(e > 16)$	\$9125.378 \$11200.89 \$11325.07 \$11232.91 \$11590.56	CPS 2017
Risk Aversion Coefficient	γ	2.0	Lochner and Monge-Naranjo (2012) and Johnson (2013)

Table C5: Estimation of Parental Transfer Function

	(1) Probit (Transfers>0)		(2) Log Transfers	
main				
In First/Second Year College	0.566	(0.402)	2.786**	(0.616)
In Third/Fourth Year College	0.820*	(0.438)	3.004**	(0.665)
In Graduate School	0.397	(0.486)	2.679**	(0.742)
Parents' Net Worth T2	-0.005	(0.037)	0.209**	(0.064)
Parents' Net Worth T3	0.107**	(0.042)	0.513**	(0.070)
Parents' Schooling 12 Years	0.013	(0.047)	0.009	(0.092)
Parents' Schooling 13 to 15 Years	0.156**	(0.048)	0.204**	(0.092)
Parents' Schooling $\geq$ 16 Years	0.363**	(0.067)	0.457**	(0.116)
Parents' Schooling $\geq$ 16 Years * Parents' Net Worth T3	0.057	(0.068)	-0.189*	(0.099)
Parents' Schooling 12 Years * in School	0.142	(0.150)	0.618**	(0.223)
Parents' Schooling 13 to 15 Years * in School	0.282**	(0.140)	0.488**	(0.208)
Parents' Schooling $\geq$ 16 Years * in School	0.264*	(0.145)	0.859**	(0.212)
Age	-0.032**	(0.008)	0.160**	(0.015)
Age * in School	-0.013	(0.019)	-0.133**	(0.030)
Age 17	-0.041	(0.056)	0.166*	(0.096)
Age 18	0.366**	(0.055)	0.139*	(0.084)
Age 19	0.246**	(0.056)	0.284**	(0.086)
Age 20	0.221**	(0.052)	0.237**	(0.075)
> Age 23	-0.288**	(0.055)	-0.660**	(0.095)
Cognitive Ability	0.048**	(0.015)	0.045*	(0.025)
Noncognitive Ability	0.097**	(0.025)	-0.095**	(0.044)
In School Previously	0.336**	(0.038)	0.491**	(0.061)
Constant	-0.236	(0.183)	2.534**	(0.339)
Observations	11584		3627	
R^2			0.258	

Standard errors in parentheses

Parental transfers are in 2004 dollars.

* $p < 0.10$, ** $p < 0.05$

D Estimation Method and Results

D.1 Targeted Moments for SMM Estimation

Table D6: Targeted Moments for SMM Estimation

Targeted Moments	# Moments
Choice probabilities, state variables, and outcome variables over age	
Probability of engaging unhealthy behavior for each age 16 to 30	15
Probability of initiating unhealthy behavior for each age 16 to 25	10
Probability of schooling for each age 16 to 27	12
Average log earnings for each age 16 to 30	15
Average and median net worth at ages 20, 25 and 30	6
Average years of schooling, health status, years of unhealthy behavior at age 30	3
Probabilities of high school dropouts, high school graduates, and some college at ages 25 and 30	6
Probabilities of more than 4-year college at age 30	1
Probability of enrolling in college at age 21	1
Probability of graduating from 4-year college at age 25	1
Probability of part-time working while in school for age 16 to 17 and age 18 to 27	2
Average log earnings when working part-time while in school	1
Conditional moments	
Median net worth, average net worth, and average negative net worth at age 25 and age 30 by 4 education categories	24
Average health status at age 25 and age 30 by 4 education categories	8
Average years of unhealthy behavior at age 25 and age 30 by 4 education categories	8
Average rate of engaging unhealthy behavior at age 25 and age 30 by 4 education categories	8
Average earnings at age 25 and age 30 by 4 education categories	8
Average log earnings at age 25 and age 30 by 4 education categories	8
S.D. of log earnings at age 25 and age 30 by 4 education categories	8
Bottom 5 percentile of log earnings at age 25 and age 30 by 4 education categories	8
Probability of engaging unhealthy behavior for each age 16 to 30 by whether has a college degree	30
Fraction of never smokers by whether has a 4-year college degree	2
Probability of initiating unhealthy behavior by whether has a 4-year college degree	2
Probability of engaging unhealthy behavior if previously smoking conditional on whether has a 4-year college degree	2
Fraction of ever smokers at age 30	1
Average health status by whether ever smoker	2
Average health status at age 30 by whether currently smoking	2
Variance terms	
Variance of log years of schooling, log health status, log years of unhealthy behaviors, log earnings at age 30	4
Covariance terms from auxiliary models (Indirect Inference)	
Regression coefficients of unhealthy behavior on unhealthy behavior at $t-1$, unhealthy behavior at $t-2$, years of schooling, cognitive ability, noncognitive ability, health status, health status $\times$ unhealthy behavior at $t-1$, log earnings	8
Regression coefficients of unhealthy behavior on unhealthy behavior at $t-1$, years of schooling, cognitive ability, noncognitive ability, health status, and currently in school, conditional on never smoked before $t-1$	6
Regression coefficients of unhealthy behavior on unhealthy behavior at $t-2$, years of schooling, health status, conditional on engaging in unhealthy behavior in $t-1$	3
Regression coefficients of log earnings on years worked, years worked squared, years of schooling, high school graduate, some college, 4-year college, cognitive ability, cognitive ability $\times$ some college, cognitive ability $\times$ 4-year college, noncognitive ability, noncognitive ability $\times$ some college, noncognitive ability $\times$ 4-year college, and health status	13
Regression coefficients of next period's health status on current health status, unhealthy behavior, years of schooling, current enrollment, cognitive ability, noncognitive ability	6
Regression coefficients of log savings on cognitive ability, noncognitive ability, health status, age >20, age >25	5
Regression coefficients of school enrollment on parents' education, parents net worth, cognitive ability, noncognitive ability, age, health status, previous period's enrollment status	7

D.2 Parameter Estimates of Measurement Equations

Table D7: Parameter Estimates of Joint Initial Distribution of $(\theta_c, \theta_c, \log h_{17})$

	θ_c: Cognitive	θ_n: Noncognitive	$\log h_{17}$: Log Health
	Mean		
Parents Net Worth Bottom Tercile	-0.428	-0.503	-0.444
	(0.063)	(0.105)	(0.087)
Parents No College Degree	-0.497	-0.346	-0.183
	(0.045)	(0.041)	(0.087)
Constant	0.324	0.290	0.209
	(N.A.)	(N.A.)	(N.A.)
	Covariance Matrix		
θ_c: Cognitive	0.685		
	(0.050)		
θ_n: Noncognitive	0.165	0.582	
	(0.064)	(0.044)	
$\log h_{17}$: Log Health	0.153	0.318	1.486
	(0.107)	(0.092)	(0.063)

Constant terms are normalized such that $\mathbb{E}_{e_p,s_p}(\mu_c(e_p,s_p)) = \mathbb{E}_{e_p,s_p}(\mu_n(e_p,s_p)) = \mathbb{E}_{e_p,s_p}(\mu_h(e_p,s_p)) = 0$.

Table D8: Parameter Estimates of Measurement Equations

	Cognitive θ_c				Noncognitive θ_n			Health $\log h_t$		
	ASVAB: Arithmetic Reasoning	ASVAB: Mathematics Knowledge	ASVAB: Paragraph Comprehension	ASVAB: Word Knowledge	Noncognitive: Violent Behavior	Noncognitive: Had Sex bef. Age 15	Noncognitive: Theft Behavior	Health Status	Had Health Condition	Height
Cognitive Ability	1.000	0.980	0.962	0.894						
	(N.A.)	(0.017)	(0.020)	(0.017)						
Noncognitive Ability					-1.000	-1.377	-1.026			
					(N.A.)	(0.043)	(0.159)			
Log Health								1.000	-0.176	0.401
								(N.A.)	(0.147)	(0.132)
Age in 1997	-0.020	-0.026	-0.010	-0.050	-0.016	0.013	0.026	0.013	-0.054	-0.088
	(0.015)	(0.015)	(0.016)	(0.017)	(0.014)	(0.035)	(0.156)	(0.036)	(0.098)	(0.090)
Parents Education	(0.019)	0.001	0.015	-0.008	0.004	0.003	0.028	-0.025	0.011	-0.008
	0.009	0.009	0.009	0.010	0.008	0.020	0.083	0.021	0.059	0.052
Parental Net Worth T1	0.089	0.125	0.158	0.152	0.003	-0.109	0.210	-0.140	0.015	-0.205
	(0.037)	(0.037)	(0.039)	(0.043)	(0.034)	(0.082)	(0.361)	(0.085)	(0.239)	(0.216)
Constant	-0.022	-0.034	-0.009	0.002	-1.121	-1.555	-1.857	3.117	-1.022	69.917
	(0.017)	(0.017)	(0.018)	(0.020)	(0.016)	(0.038)	(0.175)	(0.040)	(0.111)	(0.098)
Measurement Error SD	0.446	0.474	0.501	0.581	1.000	1.000	1.000	1.000	1.000	3.100
	(0.013)	(0.013)	(0.014)	(0.014)	(N.A.)	(N.A.)	(N.A.)	(N.A.)	(N.A.)	(0.060)

Note: Parental Net Worth T1 is an indicator variable that equals to 1 if the parents' net worth belongs to the bottom tercile of the net worth distribution.

D.3 Parameter Estimates of the Structural Model

Table D9: Parameter Estimates on Health Production Function

Description	Parameter	Estimate	S.E.
Log (Current Health)	$\beta_{h,h}$	0.9339	0.0012
Unhealthy Behavior	$\beta_{h,1}$	-0.0680	0.0013
Age	$\beta_{h,2}$	-0.0007	0.0001
Years of Schooling	$\beta_{h,e}$	0.0075	0.0005
Cognitive Ability	$\alpha_{h,c}$	0.0085	0.0012
Noncognitive Ability	$\alpha_{h,n}$	0.0085	0.0012
Intercept Constant	$\beta_{h,3}$	-0.0682	0.0013
S.D. of Health Shock	σ_h	0.4985	0.0013

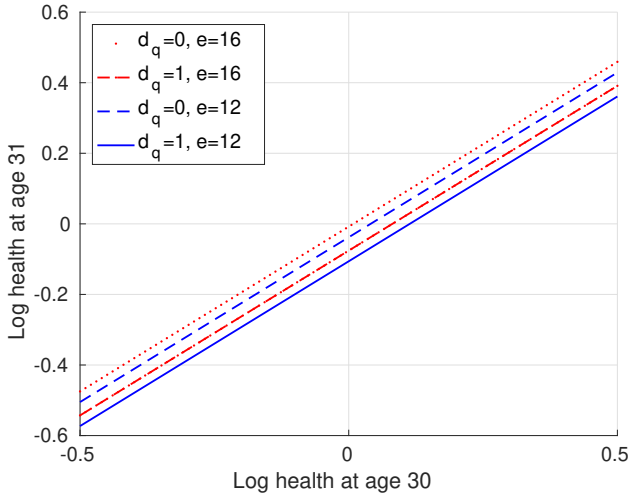


Figure D5: Health Dynamics at Age 30

This figure plots health dynamics function for age-30 individuals as a function of current health, holding their cognitive ability and noncognitive ability are at their initial mean values, i.e. $\theta_c = \theta_n = 0$.

Table D10: Parameter Estimates on Log Earnings Equation

Description	Parameter	Estimate	S.E.
Intercept	$\beta_{\psi,0}$	9.3384	0.0067
log (Health+1)	$\beta_{\psi,h}$	0.1988	0.0017
Experience	$\beta_{\psi,k,0}$	0.0700	0.0008
Experience $\times$ (Yrs of Schooling ≥ 16)	$\beta_{\psi,k,1}$	0.0114	0.0008
Experience Squared/100	$\beta_{\psi,kk}$	-0.1387	0.0013
Yrs of Schooling -12	$\beta_{\psi,e,0}$	0.0282	0.0013
Yrs of Schooling ≥ 12, < 14	$\beta_{\psi,e,1}$	0.2551	0.0016
Yrs of Schooling ≥ 14, < 16	$\beta_{\psi,e,2}$	0.2551	0.0015
Yrs of Schooling ≥ 16	$\beta_{\psi,e,3}$	0.4540	0.0015
Cognitive Ability $\times$ (Yrs of Schooling < 12)	$\alpha_{\psi,c,1}$	0.0622	0.0030
Cognitive Ability $\times$ (Yrs of Schooling ≥ 12, < 16)	$\alpha_{\psi,c,2}$	0.0905	0.0018
Cognitive Ability $\times$ (Yrs of Schooling ≥ 16)	$\alpha_{\psi,c,3}$	0.1299	0.0016
Noncognitive Ability $\times$ (Yrs of Schooling < 12)	$\alpha_{\psi,n,1}$	0.0057	0.0030
Noncognitive Ability $\times$ (Yrs of Schooling ≥ 12, < 16)	$\alpha_{\psi,n,2}$	0.1026	0.0020
Noncognitive Ability $\times$ (Yrs of Schooling ≥ 16)	$\alpha_{\psi,n,3}$	0.1264	0.0012
(Age < 18) $\times$ (18-Age)	$\beta_{\psi,t}$	-0.6318	0.0035
Part-Time Job	$\beta_{w,p}$	-1.1739	0.0015
Shock Shape Parameter	a	3.1161	0.0046
Shock Scale Parameter	b	36.1101	0.0478

Table D11: Subjective Discount Factor

Description	Parameter	Estimate	S.E.
Intercept	δ_0	4.0145	0.0059
Cognitive Ability	δ_c	0.1008	0.0016
Noncognitive Ability	δ_n	0.1014	0.0012
Health	δ_h	0.0335	0.0010

Table D12: Parameter Estimates of Flow Utility Function

Description	Parameter	Estimate	S.E.
Panel A: $u_q(\Omega_t)$			
Unhealthy Behavior × Addiction Stock	$\nu_{q,q}$	0.0104	0.0003
Unhealthy Behavior × Health Stock	$\nu_{q,h}$	-0.0008	0.0006
Unhealthy Behavior × Addiction Stock × Health Stock	$\nu_{q,qh}$	0.0003	0.0002
Unhealthy Behavior × (Yrs of Schooling-9)	$\nu_{q,e}$	-0.0002	0.0001
Unhealthy Behavior × Cognitive Ability	$\nu_{q,c}$	-0.0113	0.0005
Unhealthy Behavior × Noncognitive Ability	$\nu_{q,n}$	-0.0369	0.0007
Unhealthy Behavior Intercept	$\nu_{q,0}$	-0.0154	0.0007
S.D. of Preference Shock to Unhealthy Behavior	σ_q	0.0137	0.0007
Depreciation Rate of Addiction Stock	δ_q	0.5250	0.0014
Panel B: $u_e(\Omega_t)$			
Schooling × Health	ν_h	0.0348	0.0014
Schooling × Cognitive Ability	$\nu_{e,c}$	0.1836	0.0015
Schooling × Noncognitive Ability	$\nu_{e,n}$	0.1600	0.0015
Schooling × Parents College Degree	$\nu_{e,p}$	0.0549	0.0016
Psychic Cost of Returning to School	$\nu_{e,e}$	1.0156	0.0021
Attending High School	$\nu_{e,0}$	-0.1070	0.0051
Attending 1st to 4th year of College	$\nu_{e,1}$	-0.1226	0.0018
Attending 3rd & 4th Year of College	$\nu_{e,2}$	-0.2090	0.0020
Attending Graduate School	$\nu_{e,3}$	-0.7627	0.0019
Attending School after Age 23	$\nu_{e,a}$	-0.1642	0.0014
Working Part-Time while in School when Age < 18	$\nu_{e,k0}$	-0.0263	0.0013
Working Part-Time while in School when Age ≥ 18	$\nu_{e,k1}$	-0.0392	0.0008
S.D. of Preference Shock to Schooling	σ_e	0.3614	0.0014

Table D13: Auxiliary Model: Next Period's Health Status Regression

	Model	Data	Data S.E.
Health Status at t	0.4563	0.5275	0.0090
Yrs of Schooling	0.0203	0.0080	0.0041
Unhealthy Behavior	-0.0372	-0.1619	0.0193
In School	0.0803	0.0743	0.0180
Cognitive Ability	0.0143	0.0401	0.0103
Noncognitive Ability	0.0810	0.0554	0.0140

Table D14: Auxiliary Model: Log Earnings Regression

	Model	Data	S.D. of Data
Years Worked	0.0876	0.1073	0.0280
Years Worked Squared	-0.0026	-0.0053	0.0022
Years of Schooling	0.0366	0.0272	0.0198
High School Graduate (HSG)	0.2034	0.2253	0.0674
Some College (SCL)	0.1908	0.2590	0.0927
4-Year College Graduate (CGL)	0.4824	0.3869	0.1325
Cognitive Ability	0.0534	0.0183	0.0519
Cognitive Ability $\times$ (Yrs of Schooling 12 to 15)	0.0359	0.0740	0.0579
Cognitive Ability $\times$ (Yrs of Schooling $\geq$ 16)	0.0574	0.0697	0.0632
Noncognitive Ability	0.0131	-0.0004	0.0530
Noncognitive Ability $\times$ (Yrs of Schooling 12 to 15)	0.1068	0.0282	0.0625
Noncognitive Ability $\times$ (Yrs of Schooling $\geq$ 16)	0.1060	0.0761	0.0772
Health Status	0.0715	0.1306	0.0167

Note: Cognitive ability factor score and noncognitive ability factor score are obtained from the first-stage estimation. Parameter estimate of the constant term is not reported here.

Table D15: Auxiliary Model: Log Net Worth Regression

	Model	Data	S.D. of Data
Cognitive Ability	0.0858	0.1315	0.0467
Noncognitive Ability	0.1345	0.2277	0.0598
Health Status	0.1064	0.2364	0.0429
Age >20	0.8168	0.4796	0.0819
Age >25	0.6756	0.4728	0.1142

Note: Cognitive ability factor score and noncognitive ability factor score are obtained from the first-stage estimation. Parameter estimate of the constant term is not reported here.

Table D16: Auxiliary Model: Enrollment Regression

	Model	Data	S.D. of Data
Previously in School	0.4968	0.4074	0.0107
Age	-0.0185	-0.0294	0.0018
Parental Education	0.0246	0.0608	0.0107
Parental Net Worth	0.0041	0.0334	0.0091
Cognitive Ability	0.0831	0.0619	0.0054
Noncognitive Ability	0.0527	0.0475	0.0083
Health Status	0.0087	0.0143	0.0051

Note: Cognitive ability factor score and noncognitive ability factor score are obtained from the first-stage estimation. Parameter estimate of the constant term is not reported here.

Table D17: Auxiliary Model: Unhealthy Behavior Regression

	Model	Data	S.D. of Data
Panel A: Unhealthy Behavior			
Unhealthy Behavior at $t-1$	0.4461	0.4828	0.0272
Unhealthy Behavior at $t-2$	0.2462	0.2726	0.0113
Years of Schooling	0.0007	-0.0126	0.0017
Cognitive Ability	-0.0232	0.0030	0.0043
Noncognitive Ability	-0.1714	-0.0054	0.0059
Health Status	0.0011	-0.0181	0.0043
Health Status $\times$ Unhealthy Behavior at $t-1$	0.0061	0.0056	0.0089
Log earnings	0.0018	0.0011	0.0007
Panel B: Unhealthy Behavior (if $d_{q,\tau-2}=0$ for all $\tau \leq t$)			
Unhealthy Behavior at $t-1$	0.4905	0.5838	0.0192
Years of Schooling	-0.0014	-0.0231	0.0043
Cognitive Ability	-0.0206	-0.0021	0.0065
Noncognitive Ability	-0.2333	-0.0212	0.0100
Health Status	0.0040	-0.0336	0.0061
Enroll	-0.0266	-0.0526	0.0114
Panel C: Unhealthy Behavior (if $d_{q,t}=1$)			
Unhealthy Behavior at $t-2$	0.2371	0.1640	0.0144
Years of Schooling	-0.0113	-0.0162	0.0031
Health Status	-0.0002	-0.0166	0.0068

Note: In all the regressions, the dependent variable is the indicator variable of engaging unhealthy behavior at current period, i.e., $d_{q,t}$. Cognitive ability factor score and noncognitive ability factor score are obtained from the first-stage estimation. Parameter estimate of the constant term is not reported here.

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