

## Web Appendix to

# “The Effects of Cognitive and Noncognitive Abilities on Labor Market Outcomes and Social Behavior”<sup>34</sup>

by J. Heckman, J. Stixrud and S. Urzua

## A Data

We use the National Longitudinal Survey of Youth (NLSY79) for our empirical analysis. The NLSY is a representative sample of young Americans between the ages of 14 and 21 at the time of the first interview in 1979. The NLSY is comprised of 3 subsamples: (1) a random sample of 6111 noninstitutionalized civilian youths; (2) a supplemental sample of 5295 youths designed to oversample civilian Hispanics, blacks, and economically disadvantaged whites; (3) a sample of 1280 youths who were ages 17–21 as of January 1, 1979, and who were enlisted in the military as of September 30, 1978. The NLSY collects information on parental background, schooling decisions, labor market experiences, cognitive and noncognitive test scores and other behavioral measures of these individuals on an annual basis. In our analysis we exclude the oversample of blacks, Hispanics, economically disadvantaged whites, the military sample, and those enrolled in college at age 30. The data analysis is carried out separately for males and females. Table S26 presents descriptive statistics of the included variables.

A principal components factor analysis of the ASVAB test scores reveals that the first (“principal”) factor explains 77% of the variance for men and 72% for women. Thus, a “*g* factor” appears to emerge for cognitive skills. An analysis of 14 noncognitive items (4 from the Rotter Locus of Control Scale and 10 from the Rosenberg Self-Esteem Scale) reveals that no noncognitive “*g* factor” emerges. At least 3 factors may be necessary to explain the correlations among these items. Table S2 displays these results.

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<sup>34</sup>This supplement is available at [jenni.uchicago.edu/noncog](http://jenni.uchicago.edu/noncog).

Having analyzed the cognitive and noncognitive measures separately, we now address the relationship between cognitive and noncognitive measures. The top panel of Table S3 displays correlations of the test scores and attitude scales for males and females. Correlations among components of the ASVABs are high. Correlations among ASVABs and the noncognitive measures, and between the two noncognitive measures, are lower but non-zero. Because family background as well as age and schooling at the moment of the test may affect measured test scores, we also analyze correlations of residualized test scores. These correlations (displayed in panel (ii) of Table S3) are smaller, but again non-zero.

## **A.1 Test Scores and AFQT**

The NLSY79 contains a battery of 10 tests that measure knowledge and skill in the following areas: (1) general science; (2) arithmetic reasoning; (3) word knowledge; (4) paragraph comprehension; (5) numerical operations; (6) coding speed; (7) auto and shop information; (8) mathematical knowledge; (9) mechanical comprehension; and (10) electronics information. These tests were administered to all sample members in 1980. The following tests are used in our analysis: (i) arithmetic reasoning (ASVAB1), (ii) word knowledge (ASVAB2), (iii) paragraph comprehension (ASVAB3), (iv) mathematical knowledge (ASVAB4), and (v) coding speed (ASVAB5). A composite score derived from select sections of the battery can be used to construct an approximate and unofficial Armed Forces Qualifications Test (AFQT) score for each youth. The AFQT is a general measure of trainability and a primary criterion of enlistment eligibility for the Armed Forces, and it has been used extensively as a measure of cognitive skills in the literature (see Osborne-Groves, 2004; Ellwood and Kane, 2000; Heckman, 1995; Cameron and Heckman, 1998, 2001).

## **A.2 Attitudes (Noncognitive Measures)**

### **A.2.1 Rotter Internal-External Locus of Control Scale**

The Rotter Internal-External Locus of Control Scale, collected as part of the 1979 interviews, is a four-item abbreviated version of a 23-item forced choice questionnaire adapted from the 60-item Rotter scale developed by Rotter (1966). The scale is designed to measure the extent to which

individuals believe they have control over their lives, *i.e.*, self-motivation and self-determination, (internal control) as opposed to the extent that the environment (*i.e.*, chance, fate, luck) controls their lives (external control). The scale is scored in the internal direction: the higher the score, the more internal the individual. Individuals are first shown four sets of statements (displayed in Table S27) and asked which of the two statements is closer to their own opinion. They are then asked whether that statement is much closer or slightly closer to their opinion. These responses are used to generate four-point scales for each of the paired items, which are then averaged to create one Rotter Scale score for each individual.

### A.2.2 Rosenberg Self-Esteem Scale

The Rosenberg Self-Esteem Scale was administered during the 1980 interviews. This 10-item scale, designed for adolescents and adults, measures an individual’s degree of approval or disapproval toward himself (Rosenberg, 1965). The scale is short, widely used, and has accumulated evidence of validity and reliability. It contains 10 statements of self-approval and disapproval to which respondents are asked to strongly agree, agree, disagree, or strongly disagree. Table S28 displays these 10 items.

## B Identification of the two-factor Model

This section provides a brief discussion of the strategy used to identify our model. For the general case see Carneiro, Hansen, and Heckman (2003). For notational simplicity, we keep the conditioning on  $X$  implicit.

Consider a set of  $T$  variables such that

$$\begin{array}{ccccccc}
 Y & = & \Lambda & f & + & \varepsilon & \\
 T \times 1 & & T \times 2 & 2 \times 1 & & T \times 1 & 
 \end{array} \tag{B.1}$$

where  $f$  are factors and  $\varepsilon$  uniquenesses. The system (B.1) is assumed to include variables (such as outcomes, test scores, and attitude scales) that are non-state-contingent variables, *i.e.*, that are observable for all individuals in the sample. Outcomes such as wages conditional on educational

attainment are state-contingent variables (for example, we only observe wages as a high school graduate for those individuals whose final schooling level is actually high school graduate). After showing how to identify the system (B.1), we will discuss how to add state-contingent variables to the model. First, assume that

$$\begin{aligned}
 E(\varepsilon) &= 0 \\
 Var(\varepsilon\varepsilon') &= \Omega = \begin{pmatrix} \sigma_{\varepsilon_1}^2 & 0 & \cdots & 0 \\ 0 & \sigma_{\varepsilon_2}^2 & 0 & \vdots \\ \vdots & 0 & \ddots & \vdots \\ 0 & \cdots & 0 & \sigma_{\varepsilon_T}^2 \end{pmatrix} \\
 E(f) &= 0 \\
 Var(Y) &= \Lambda \Sigma_f \Lambda' + \Omega \tag{B.2} \\
 \Sigma_f &= \begin{pmatrix} \sigma_{f_1}^2 & \sigma_{f_1, f_2} \\ \sigma_{f_1, f_2} & \sigma_{f_2}^2 \end{pmatrix}
 \end{aligned}$$

The only source of information on  $\Lambda$  and  $\Sigma_f$  that we use is from the covariances.<sup>35</sup> Associated with each variance of  $Y_i$  is a  $\sigma_{\varepsilon_i}^2$ . Each variance contributes one new parameter. Notice that we have  $\frac{T(T-1)}{2}$  unique covariance terms from the data. With this number of covariances we want to identify:

- $\sigma_{\varepsilon_t}^2$  for  $t = 1, \dots, T$  ( $T$  unknowns).
- $2T$  factor loadings contained in the matrix  $\Lambda$
- Four elements of  $\Sigma_f$

At this level of generality, the model is not identified. This can be seen using the following argument. Let  $C$  be an orthogonal matrix (*i.e.*,  $CC' = I$ ). Thus,  $Var(Y)$  can be written as

$$Var(Y) = \Lambda C [C' \Sigma_f C] C' \Lambda' + \Omega. \tag{B.3}$$

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<sup>35</sup>Bonhomme and Robin (2004) and Heckman and Navarro (2006) show how the assumption of non-normal factors produces additional identifying information beyond the covariances. From their analysis, it is possible to identify one factor per measurement so the Lederman bound can be relaxed.

Notice that (B.3) is a valid representation of (B.2). The matrix  $C$  is called a *rotation*. Therefore, we cannot separate  $\Lambda C$  from  $\Lambda$ . Consequently the model is not identified against orthogonal transformations.

In order to identify the model we must impose some assumptions. The following are sufficient assumptions, other sets of assumptions are possible.

**Assumption 1:**  $f_1 \perp\!\!\!\perp f_2$ , so

$$\Sigma_f = \begin{pmatrix} \sigma_{f_1}^2 & 0 \\ 0 & \sigma_{f_2}^2 \end{pmatrix}$$

**Assumption 2:** Since the scale of each factor is arbitrary, one loading devoted to each factor is normalized to unity to set the scale

$$\Lambda = \begin{pmatrix} 1 & \alpha_{12} \\ \alpha_{21} & \alpha_{22} \\ \alpha_{31} & 1 \\ \alpha_{41} & \alpha_{42} \\ \alpha_{51} & \alpha_{52} \\ \vdots & \vdots \\ \alpha_{T1} & \alpha_{T2} \end{pmatrix}$$

With these assumptions, working only with covariance information, we require that

$$\frac{2T - 2}{\# \text{ of unrestricted parameters in } \Lambda} + \frac{2}{\# \text{ of variances in } \Sigma_f} \leq \frac{T(T - 1)}{2}, \quad \# \text{ of covariances computed from the data}$$

so  $T \geq 5$  is a necessary condition for identification. Our empirical model satisfies the condition  $T > 5$ , so we achieve this condition.

To render greater interpretability to the two factors, consider the following structure for the

system (B.1)

$$Y = \begin{bmatrix} C \\ N \\ R \end{bmatrix}_{T \times 1} = \Lambda \begin{matrix} T \times 2 \\ 2 \times 1 \end{matrix} f + \begin{matrix} T \times 1 \\ T \times 1 \end{matrix} \varepsilon$$

where  $C$  is vector of dimension  $n_C(\geq 2)$ ,  $N$  is vector of dimension  $n_N(\geq 2)$ , and  $R$  is a vector of dimension  $n_R = T - n_N - n_C(> 0)$ . The vectors  $C$  and  $N$  represent the sets of cognitive and noncognitive measures, respectively. We allow  $R$  to contain additional variables of interest.

**Assumption 3:**

$$\Lambda = \begin{pmatrix} 1 & 0 \\ \alpha_2^C & 0 \\ \vdots & \vdots \\ \alpha_{n_C}^C & 0 \\ 0 & 1 \\ 0 & \alpha_2^N \\ \vdots & \vdots \\ 0 & \alpha_{n_N}^N \\ \alpha_1^{C,R} & \alpha_1^{N,R} \\ \vdots & \vdots \\ \alpha_{n_R}^{C,R} & \alpha_{n_R}^{N,R} \end{pmatrix}$$

Assumption 3 implies that  $f^C$  and  $f^N$  each has an exclusive system of measurements of the

form:

$$\left. \begin{array}{l}
 C_1 = f^C \quad + \quad \varepsilon_1^C \\
 C_2 = \alpha_1^C f^C \quad + \quad \varepsilon_2^C \\
 \vdots \\
 C_{n_C} = \alpha_{n_C}^C f^C \quad + \quad \varepsilon_{n_C}^C
 \end{array} \right\} \text{Cognitive Ability}$$
  

$$\left. \begin{array}{l}
 N_1 = f^N \quad + \quad \varepsilon_1^N \\
 N_2 = \alpha_1^N f^N \quad + \quad \varepsilon_2^N \\
 \vdots \\
 N_{n_N} = \alpha_{n_N}^N f^N \quad + \quad \varepsilon_{n_N}^N
 \end{array} \right\} \text{Noncognitive Ability}$$

By taking ratios of covariances of  $Y_l$  and  $Y_j$  for  $l \neq j$  we can identify the elements of  $\Lambda$  and  $\Sigma_f$ .<sup>36</sup> By using the variances of  $Y_t$  for  $t = 1, \dots, T$ , we can then identify the elements of  $\Omega$ . Therefore, this structure allows us not only to identify the parameters of the model but also to give an interpretation to the factors.

Now, consider identification of state-contingent variables. For concreteness, consider identification of the parameters of

$$W_1 = \alpha_{W_1}^C f^C + \alpha_{W_1}^N f^N + \varepsilon_{W_1} \tag{B.4}$$

$$W_0 = \alpha_{W_0}^C f^C + \alpha_{W_0}^N f^N + \varepsilon_{w_0} \tag{B.5}$$

where  $W_1$  denotes wages conditional on being a high school graduate, and  $W_0$  denotes wages conditional on being a high school dropout. The problem occurs because we cannot observe  $Cov(W_1, W_0)$ —in the data we will not observe wages at age 30 as both a high school dropout and a high school graduate for any individual. However, because we observe elements of  $C$  and  $N$  for all individuals we can take  $Cov(C_1, W_1)$  and  $Cov(C_1, W_0)$ , and this will allow us to identify the parameters associated with  $W_1$  and  $W_0$ . For details, see Carneiro, Hansen, and Heckman (2003).

Finally, we present an explicit example of how to identify a two-factor model with  $T = 5$ .

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<sup>36</sup>For details see Carneiro, Hansen, and Heckman (2003).

Assume,

$$f^C \perp\!\!\!\perp f^N$$

$$\varepsilon_i \perp\!\!\!\perp \varepsilon_j \quad \forall i, j$$

$$Y_1 = \alpha_{11}f_1 + (0)f_2 + \varepsilon_1$$

$$Y_2 = \alpha_{21}f_1 + (0)f_2 + \varepsilon_2$$

$$Y_3 = \alpha_{31}f_1 + \alpha_{32}f_2 + \varepsilon_3$$

$$Y_4 = \alpha_{41}f_1 + \alpha_{42}f_2 + \varepsilon_4$$

$$Y_5 = \alpha_{51}f_1 + \alpha_{52}f_2 + \varepsilon_5$$

Let  $\alpha_{11} = 1$  and  $\alpha_{32} = 1$ . Taking covariances,

$$Cov(Y_1, Y_2) = \alpha_{21}\sigma_{f_1}^2$$

$$Cov(Y_1, Y_3) = \alpha_{31}\sigma_{f_1}^2$$

$$Cov(Y_2, Y_3) = \alpha_{21}\alpha_{31}\sigma_{f_1}^2$$

Now, take ratios of these covariances

$$\frac{Cov(Y_2, Y_3)}{Cov(Y_1, Y_2)} = \alpha_{31} \tag{B.6}$$

$$\frac{Cov(Y_2, Y_3)}{Cov(Y_1, Y_3)} = \alpha_{21} \tag{B.7}$$

Having identified  $\alpha_{21}$  and  $\alpha_{31}$ , we can identify

$$\sigma_{f_1}^2 = \frac{Cov(Y_1, Y_2)}{\alpha_{21}} \tag{B.8}$$



Now,

$$\text{Cov}(Y_1, Y_4) = \alpha_{41}\sigma_{f_1}^2$$

$$\text{Cov}(Y_1, Y_5) = \alpha_{51}\sigma_{f_1}^2$$

so that we can also identify  $\alpha_{41}$  and  $\alpha_{51}$ . Now, moving identified parameters to the left-hand side, we are left with the following system

$$\text{Cov}(Y_3, Y_4) - \alpha_{31}\alpha_{41}\sigma_{f_1}^2 = \alpha_{42}\sigma_{f_2}^2$$

$$\text{Cov}(Y_3, Y_5) - \alpha_{31}\alpha_{51}\sigma_{f_1}^2 = \alpha_{52}\sigma_{f_2}^2$$

$$\text{Cov}(Y_4, Y_5) - \alpha_{41}\alpha_{51}\sigma_{f_1}^2 = \alpha_{52}\alpha_{42}\sigma_{f_2}^2,$$

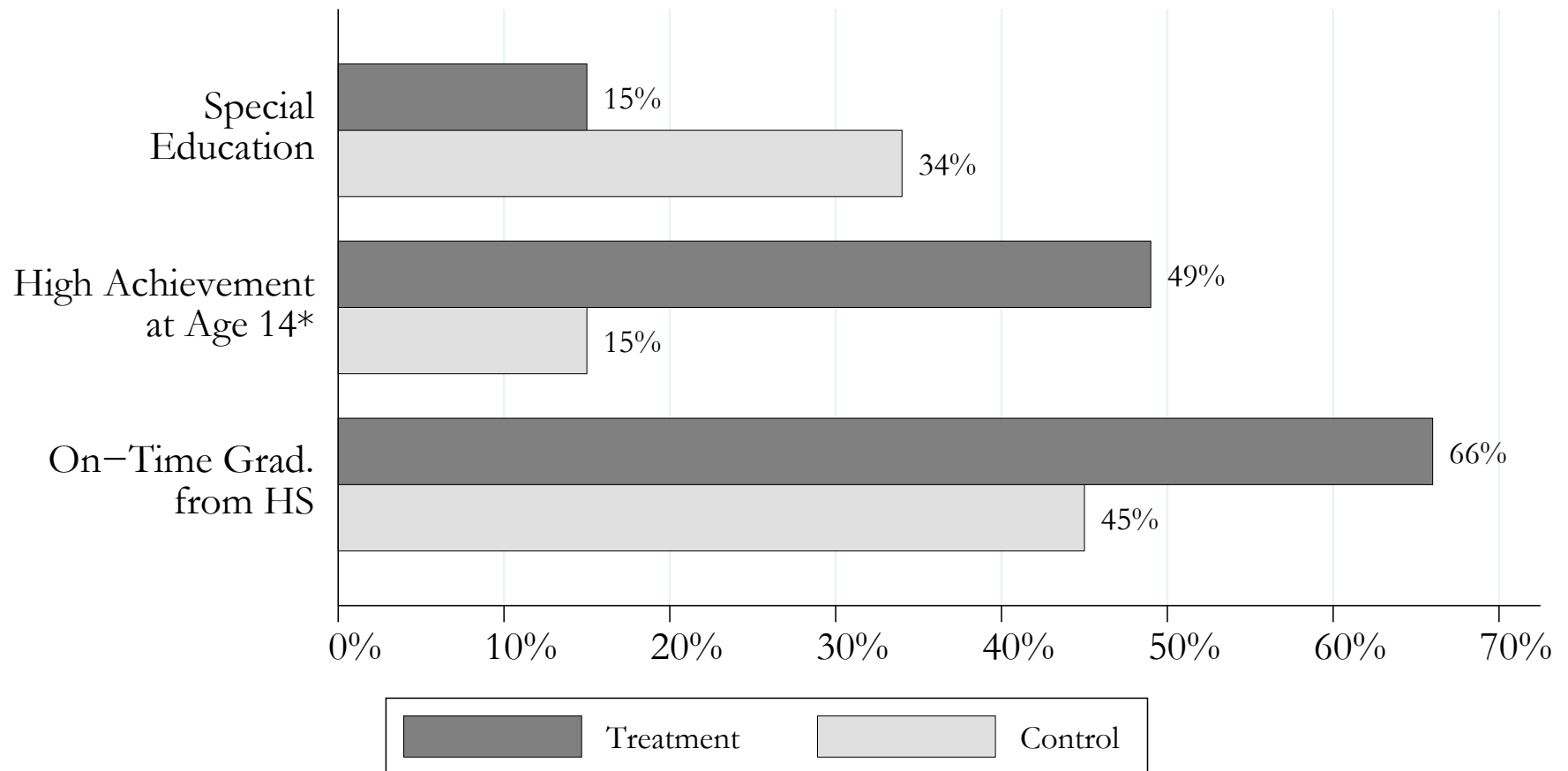
By the same logic,

$$\frac{\text{Cov}(Y_4, Y_5) - \alpha_{41}\alpha_{51}\sigma_{f_1}^2}{\text{Cov}(Y_3, Y_4) - \alpha_{31}\alpha_{41}\sigma_{f_1}^2} = \alpha_{52}$$

so we can identify  $\alpha_{42}$ ,  $\alpha_{52}$ , and  $\sigma_{f_2}^2$ .

## Figure S1A

### Perry Preschool Program: Educational Effects, by Treatment Group

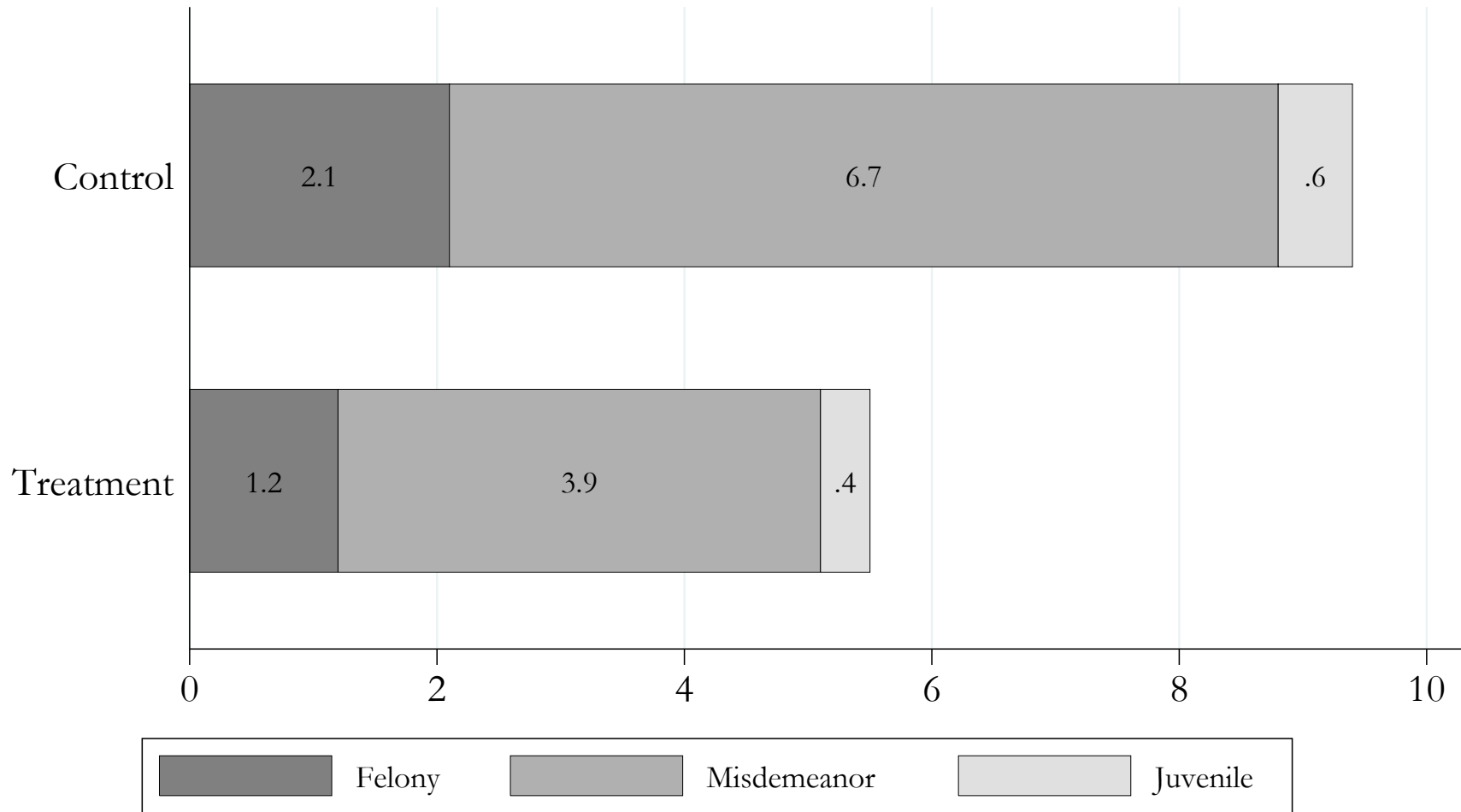


Source: Barnett (2004).

Notes: \*High achievement defined as performance at or above the 10th percentile on the California Achievement Test (1970).

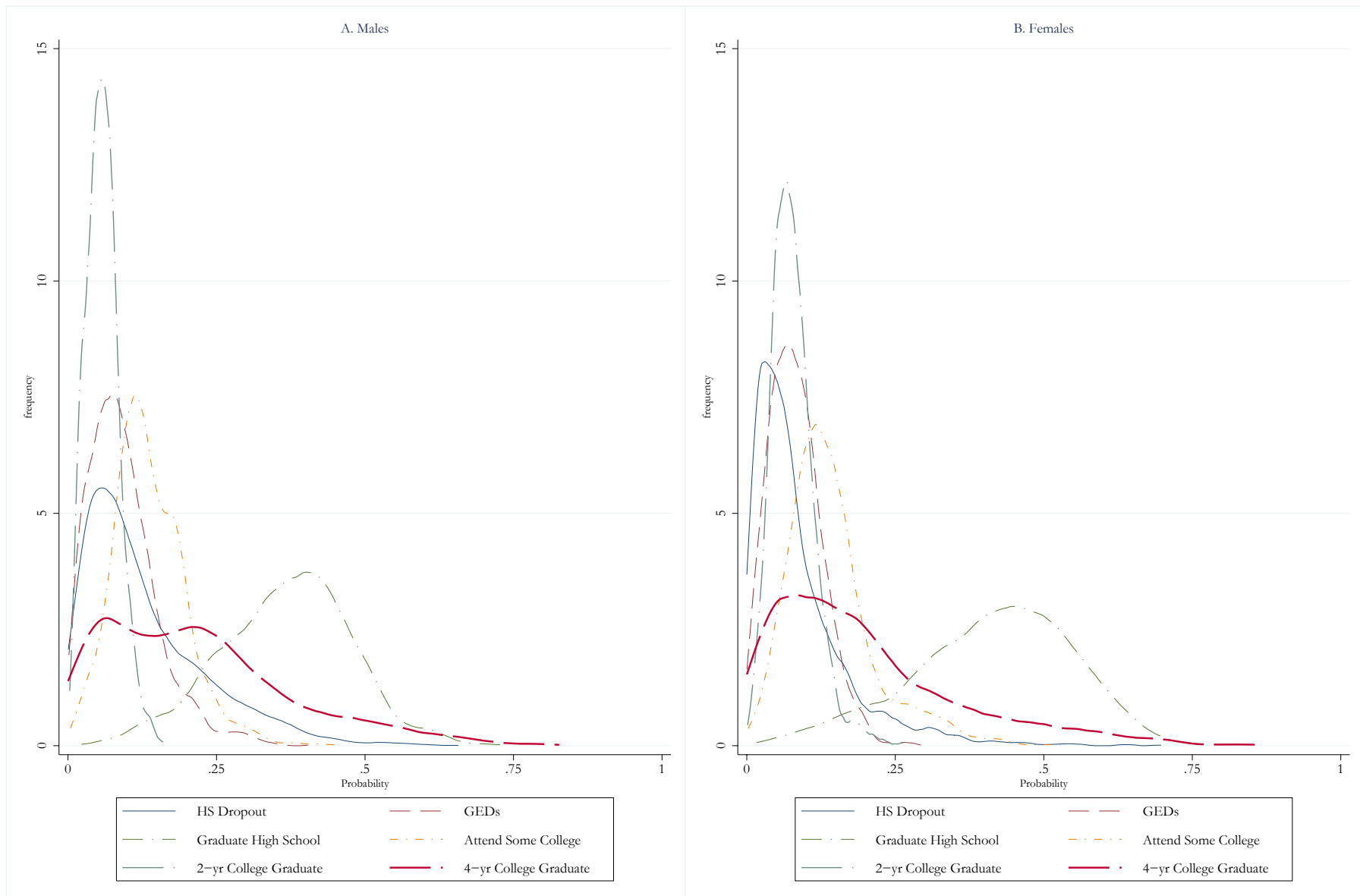
# Figure S1B

## Perry Preschool Program: Arrests per Person before Age 40, by Treatment Group



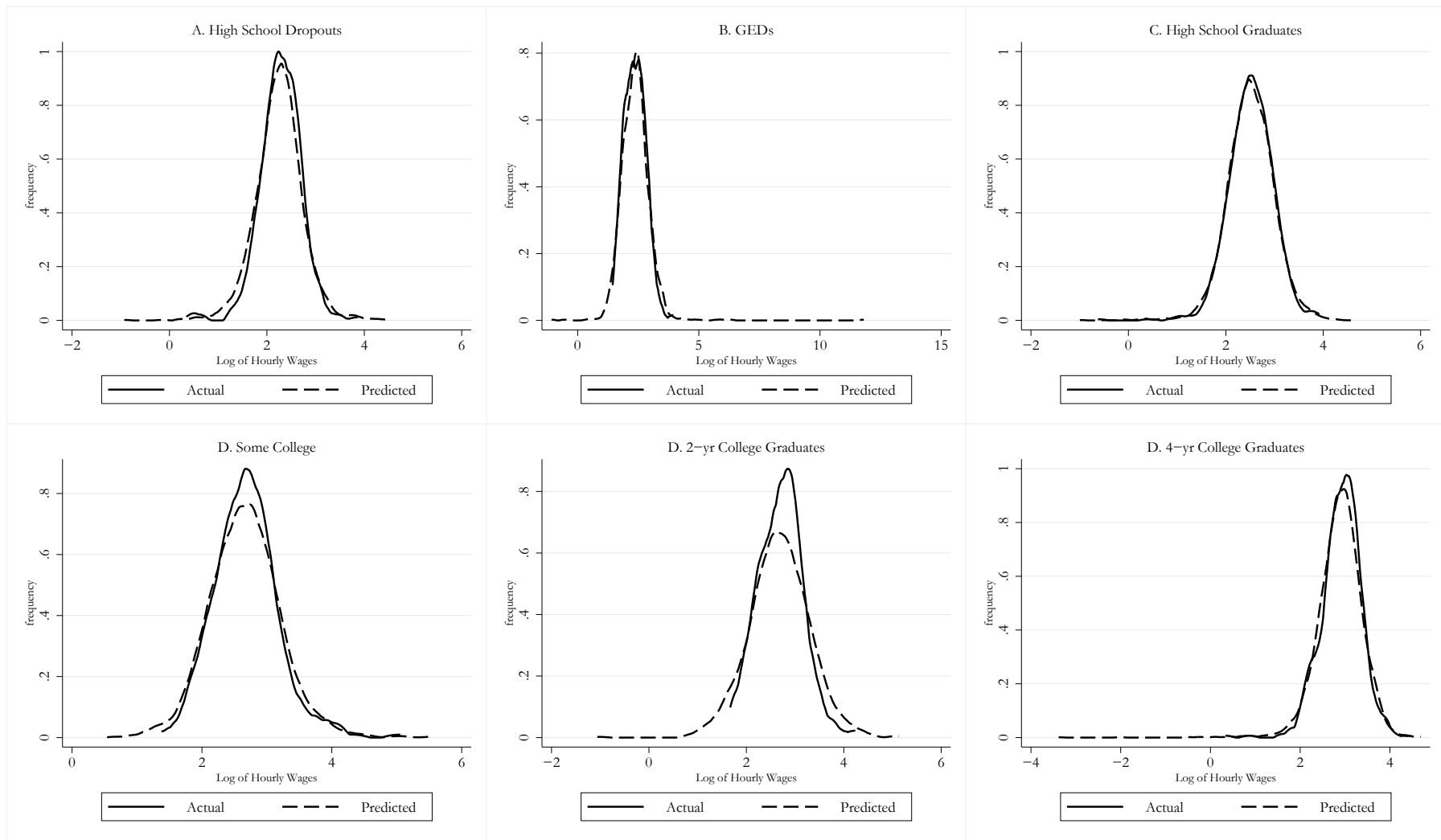
Source: Perry Preschool Program. Juvenile arrests are defined as arrests prior to age 19.

Figure S2. Distribution of the Probabilities of Final Schooling Level



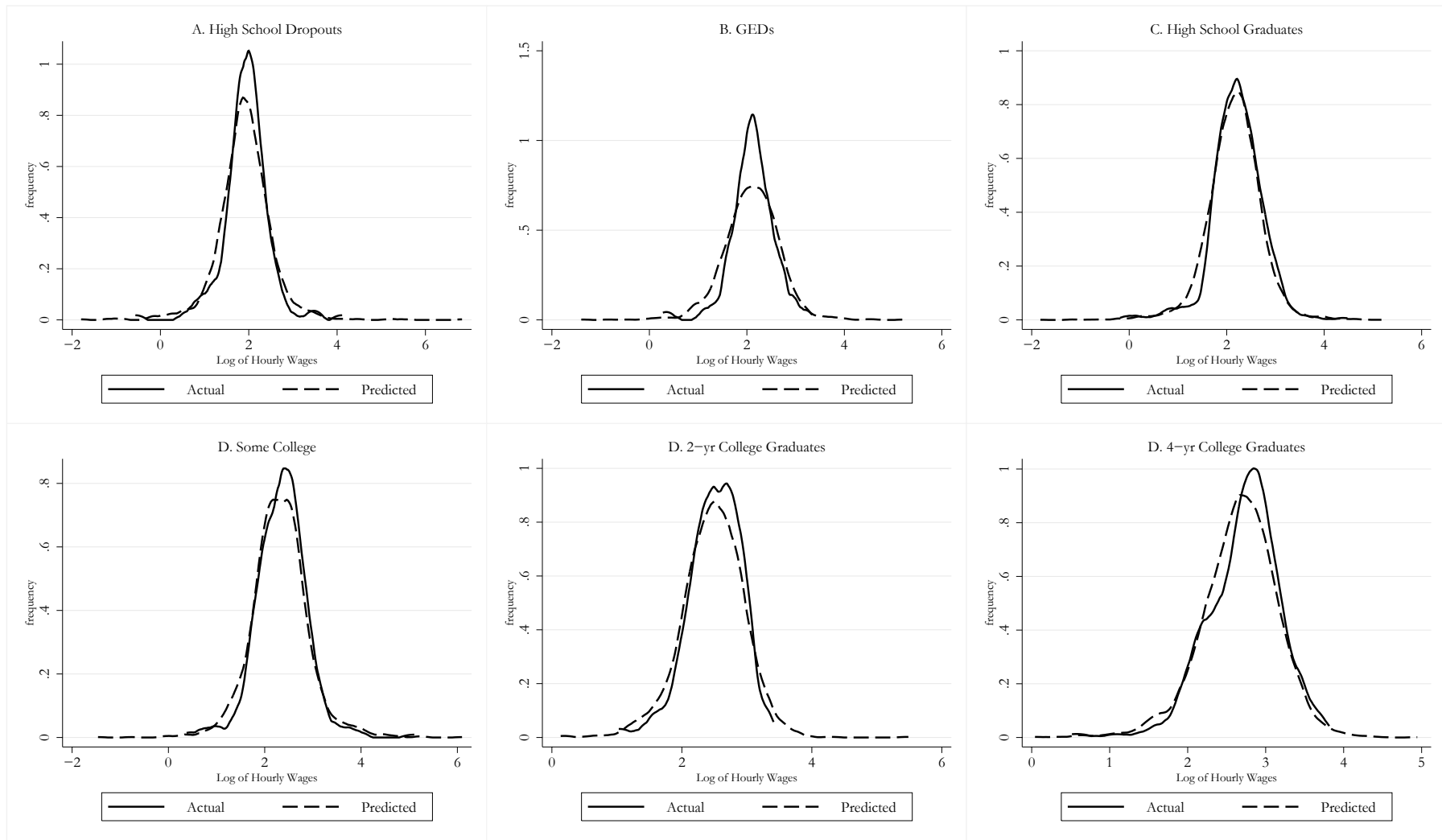
Notes: The probabilities were computed using GHK and montecarlo integration.

Figure S3A. Observed versus Predicted Wages – Males at Age 30



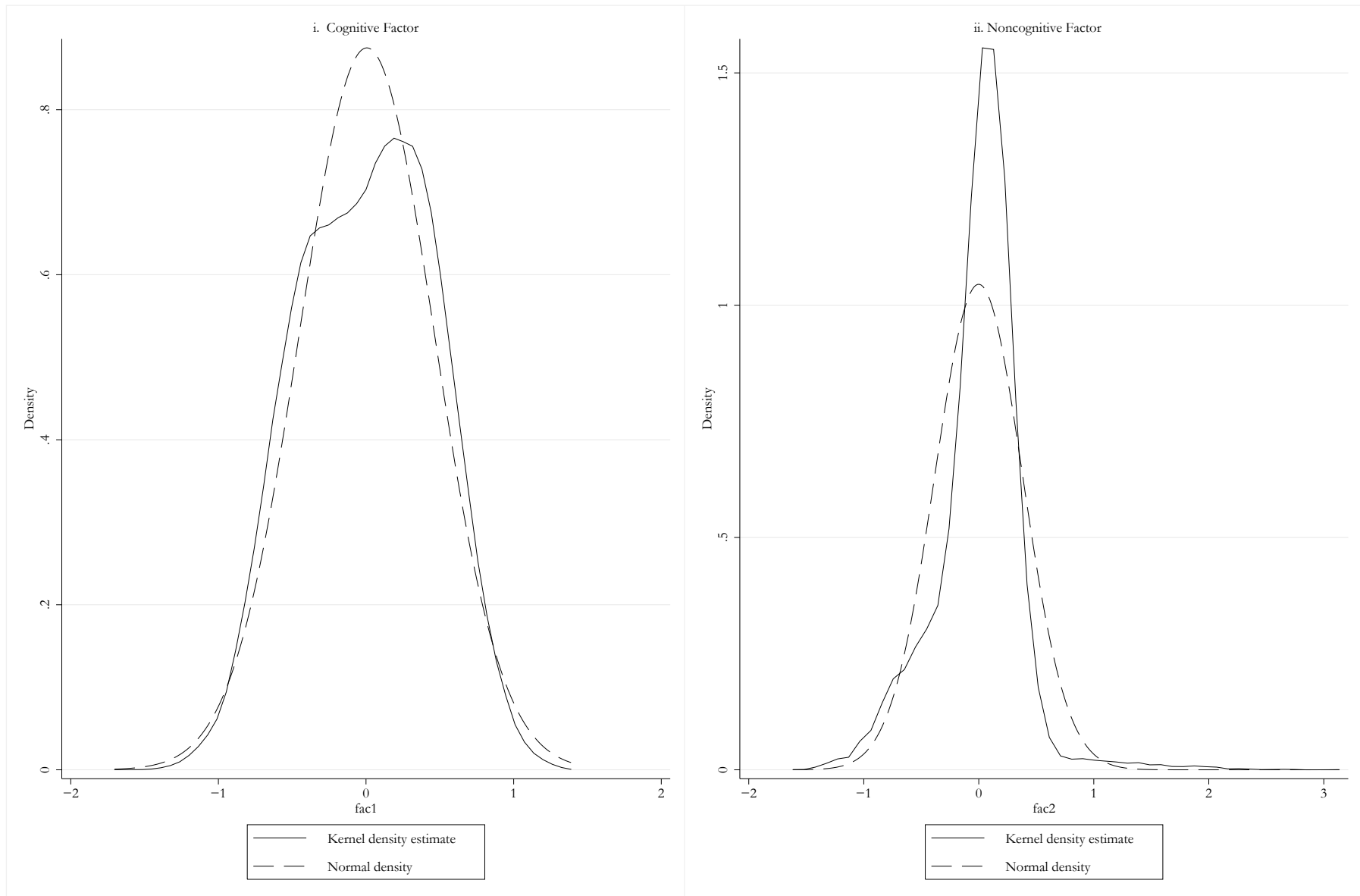
Note: (a) The solid line depicts the actual distribution of log hourly wage in the data for each of the educational levels. (b) We model log hourly wages using a set of six linear equations. The dashed line is computed after simulating a sample of over 50,000 individuals using the structure and estimates of the model.

Figure S3B. Observed versus Predicted Wages – Females at Age 30



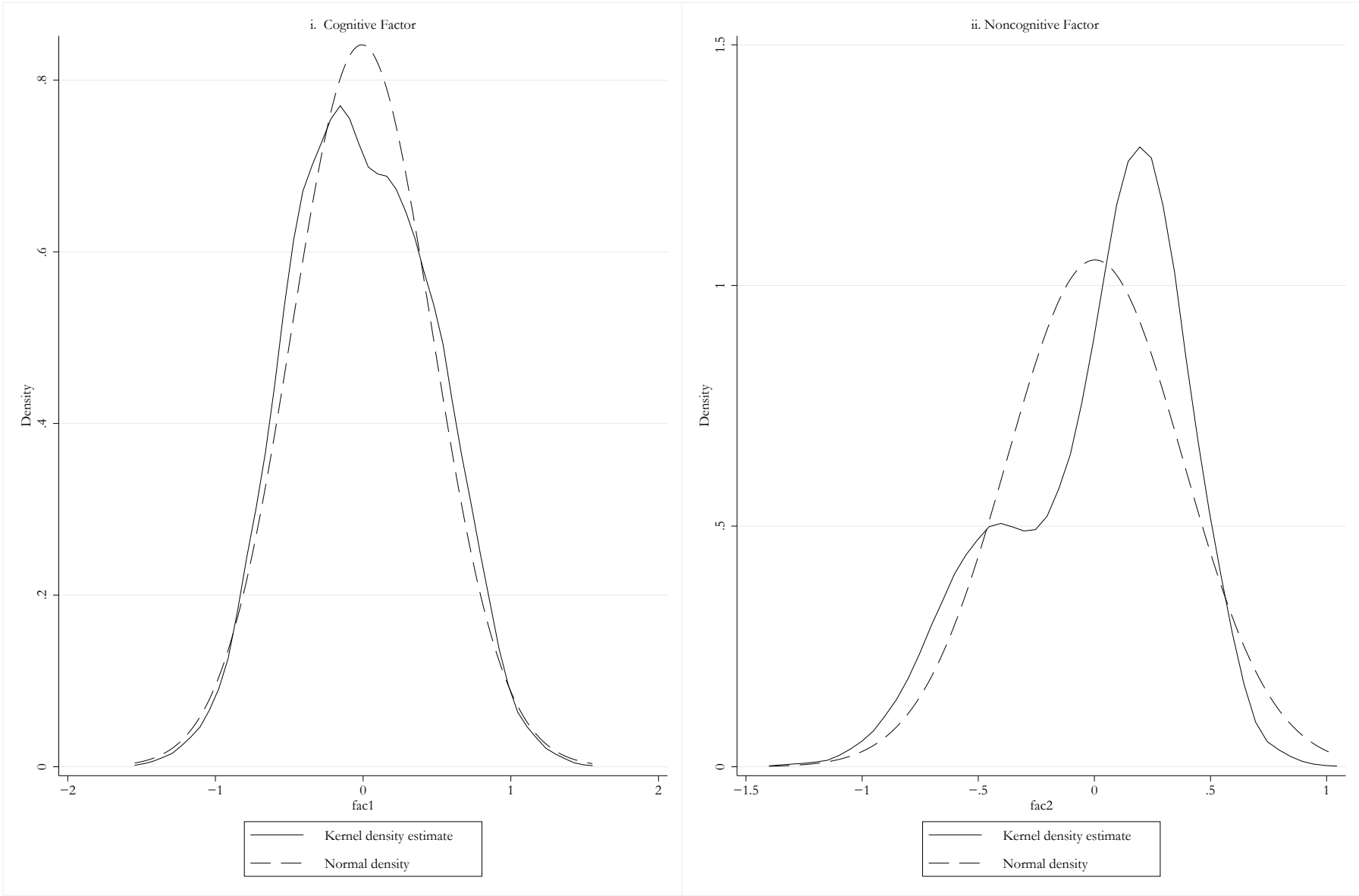
Note: (a) The solid line depicts the actual distribution of log hourly wage in the data for each of the educational levels. (b) We model log hourly wages using a set of six linear equations. The dashed line is computed after simulating a sample of over 50,000 individuals using the structure and estimates of the model.

Figure S4A. Densities of Estimated Factors and their Normal Equivalents--Males



Notes: The factors are simulated from the estimates of the model. The simulated data contain 20,000 observations.

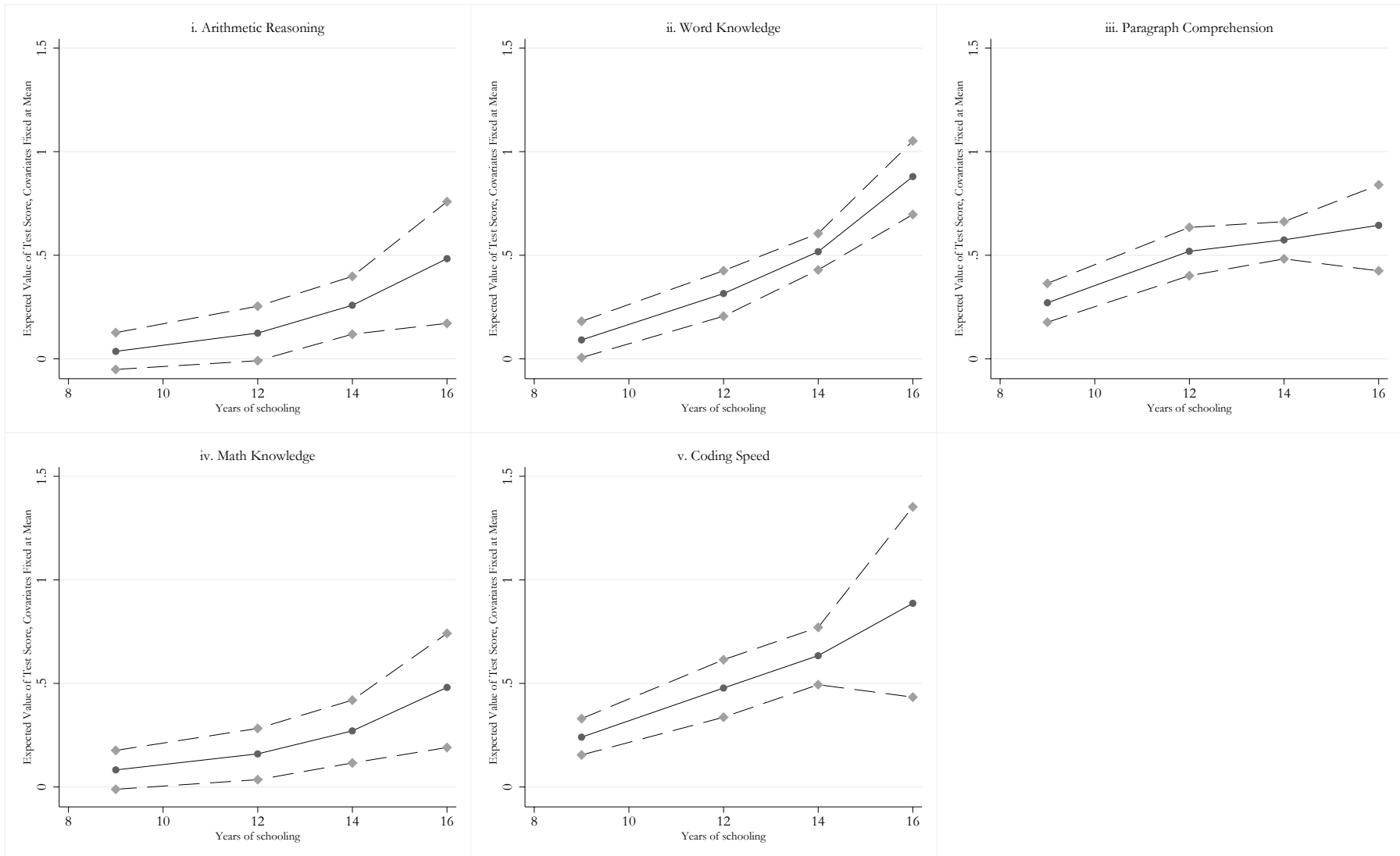
Figure S4B. Densities of Estimated Factors and their Normal Equivalents--Females



Notes: The factors are simulated from the estimates of the model. The simulated data contain 20,000 observations.

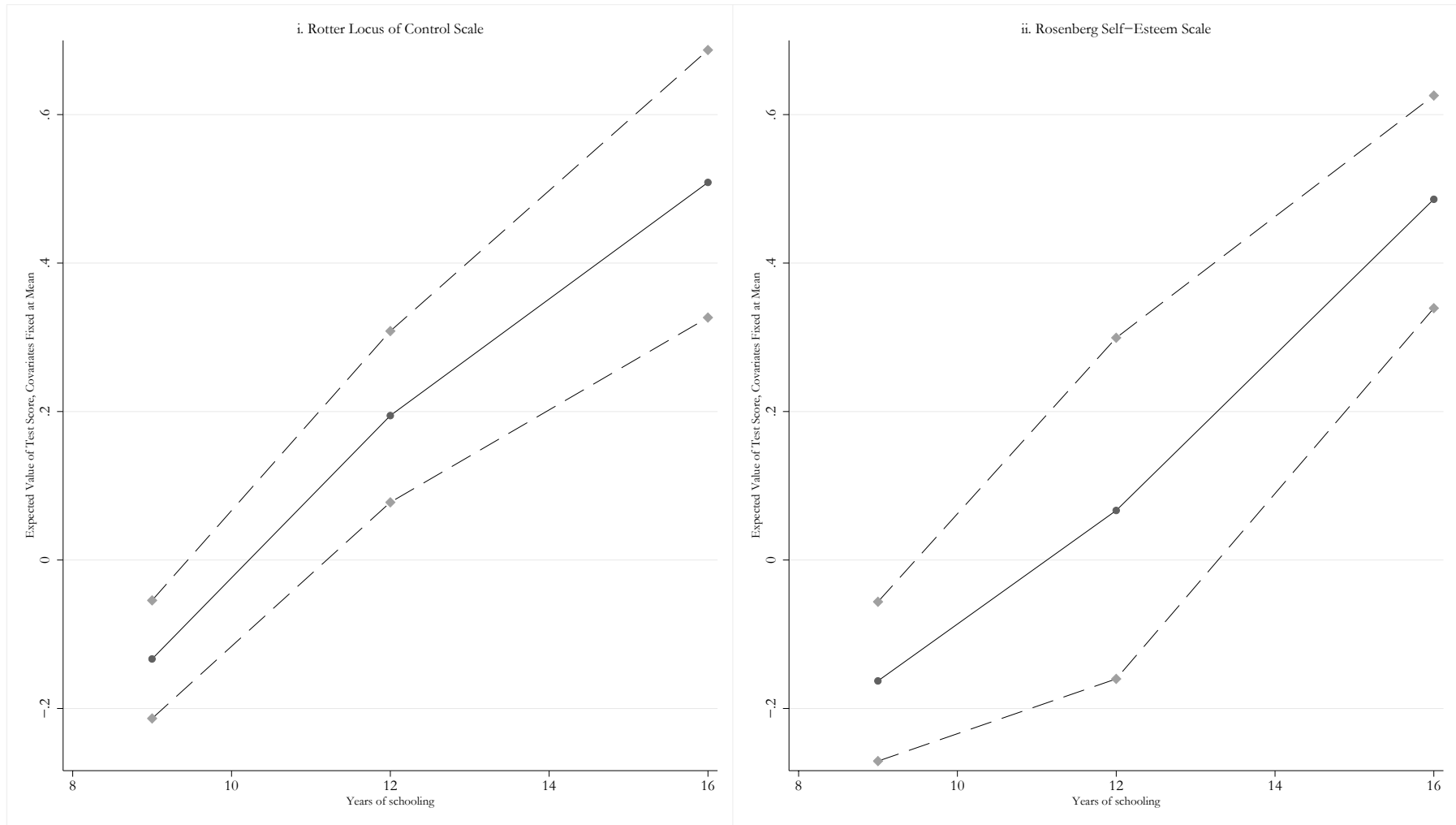


Figure S5A. Effect of schooling on ASVAB Components for person with average ability with 95% confidence bands--Females



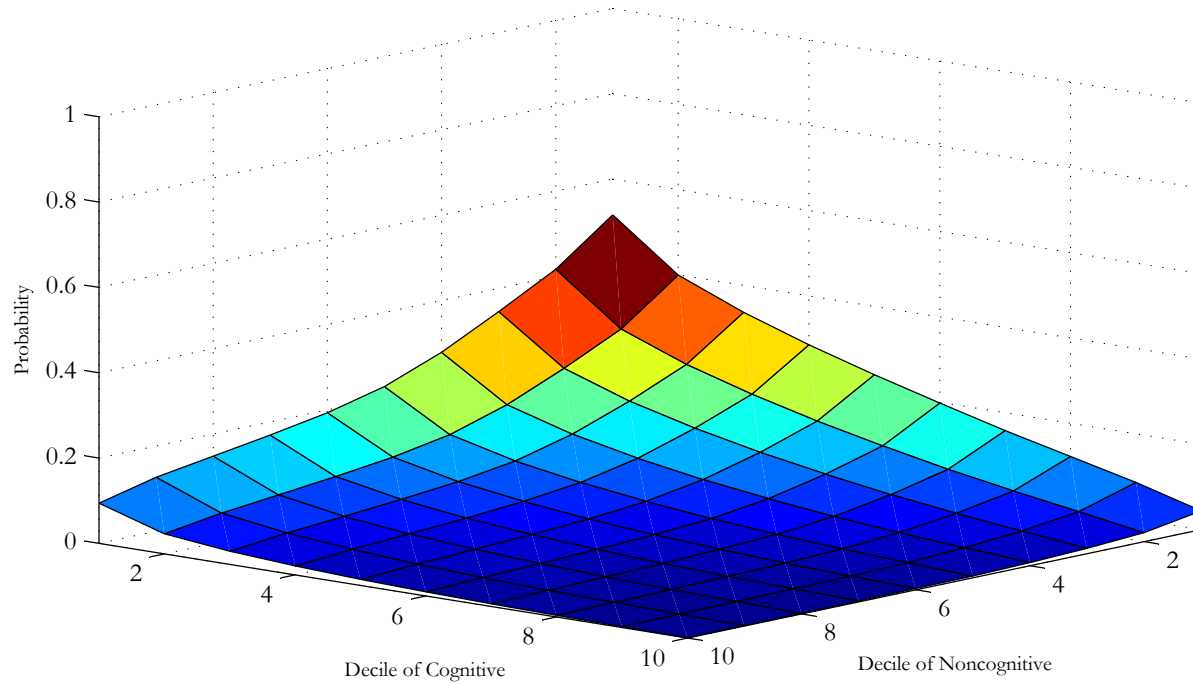
Notes: We standardize the test scores to have within-sample mean 0, variance 1. The model is estimated using the Age 30 NLSY79 Sample. We exclude the oversample of blacks, Hispanics, poor whites, the military sample, and those currently enrolled in college.

Figure S5B. Effect of schooling on Non-Cognitive scales for person with average ability  
with 95% confidence bands--Females

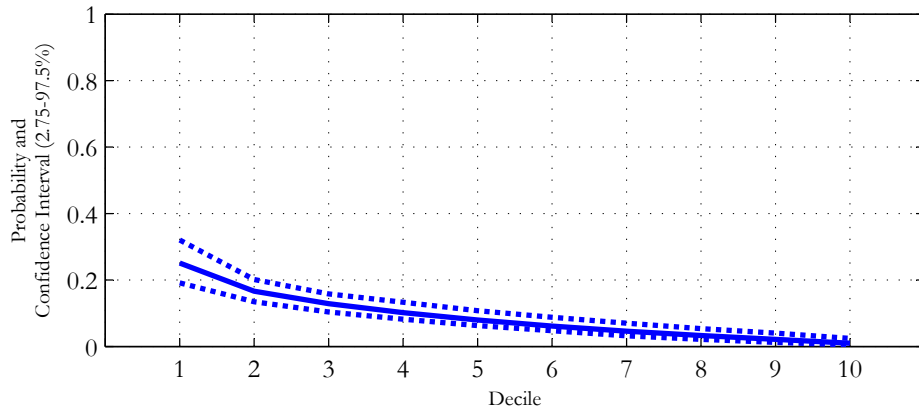


Notes: The locus of control scale is based on the four-item abbreviated version of the Rotter Internal-External Locus of Control Scale. This scale is designed to measure the extent to which individuals believe they have control over their lives through self-motivation or self-determination (internal control) as opposed to the extent that the environment controls their lives (external control). The self-esteem scale is based on the 10-item Rosenberg Self-Esteem Scale. This scale describes a degree of approval or disapproval toward oneself. In both cases, we standardize the test scores to have within-sample mean 0 and variance 1, after taking averages over the respective sets of scales. The model is estimated using the Age 30 NLSY79 Sample. We exclude the oversample of blacks, Hispanics, poor whites, the military sample, and those currently enrolled in college.

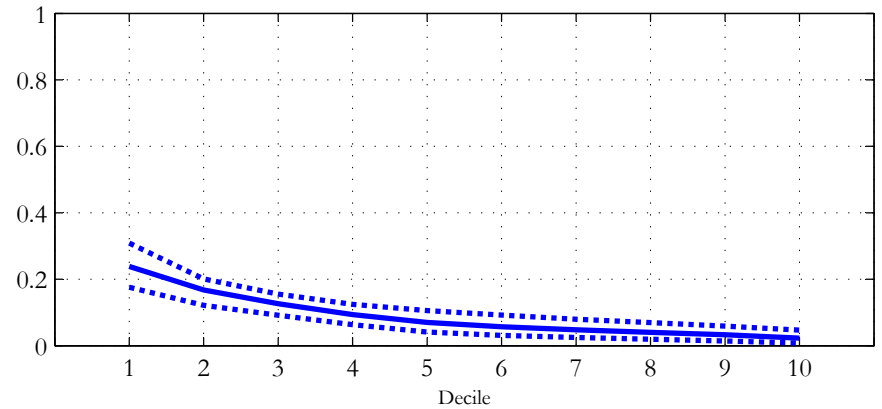
Figure S6. Probability of Being a High School Dropout by Age 30 - Females  
 i. By Decile of Cognitive and Noncognitive Factors



ii. By Decile of Cognitive Factor

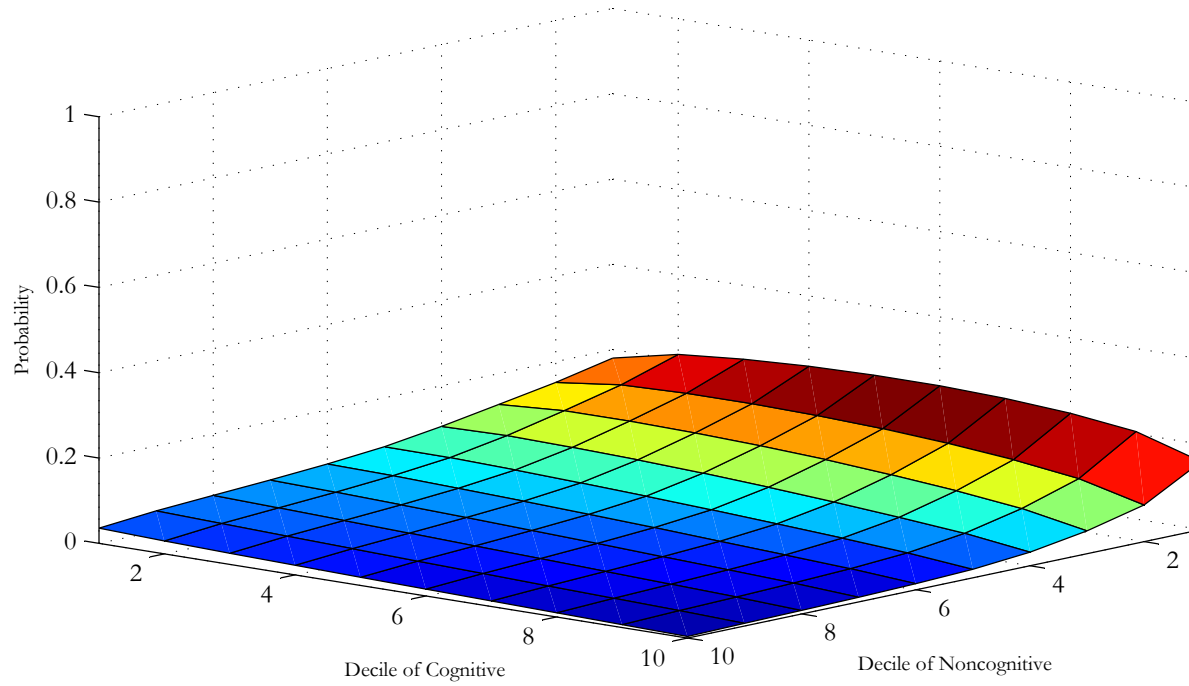


iii. By Decile of Noncognitive Factor

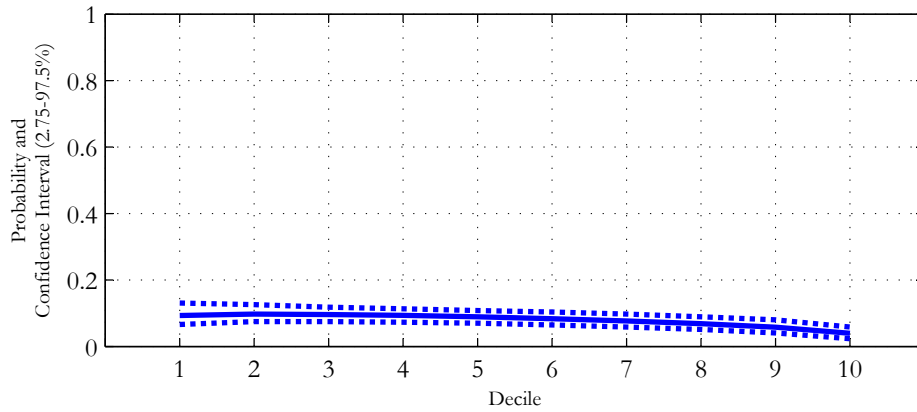


Notes: The data are simulated from the estimates of the model and our NLSY79 sample. We use the standard convention that higher deciles are associated with higher values of the variable. The confidence intervals are computed using bootstrapping (200 draws).

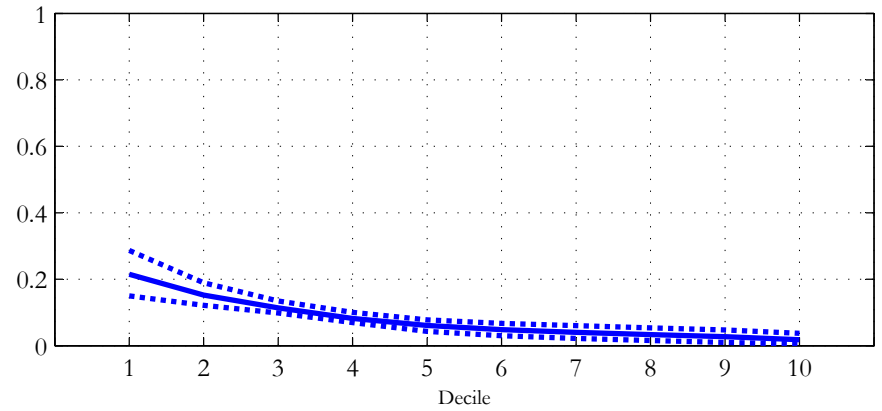
Figure S7. Probability of Being a GED by Age 30 - Females  
 i. By Decile of Cognitive and Noncognitive Factors



ii. By Decile of Cognitive Factor

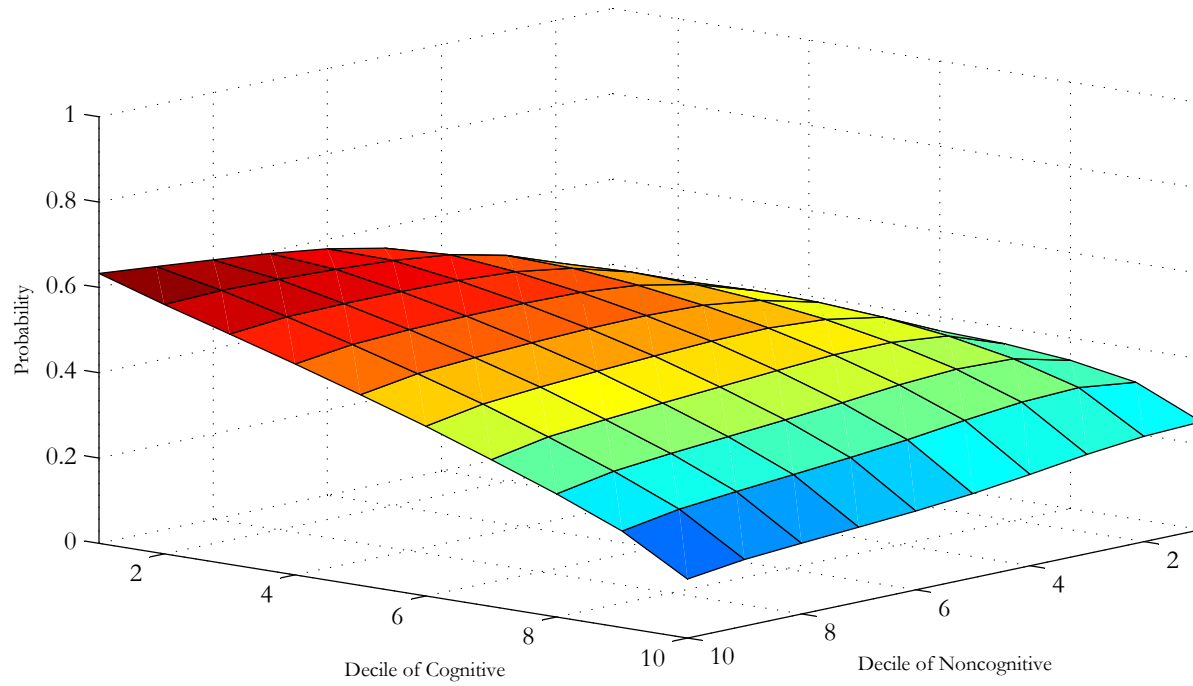


iii. By Decile of Noncognitive Factor

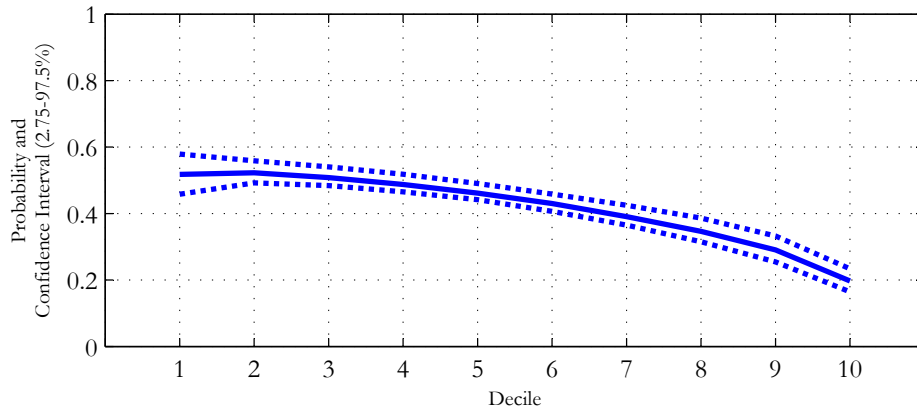


Notes: The data are simulated from the estimates of the model and our NLSY79 sample. We use the standard convention that higher deciles are associated with higher values of the variable. The confidence intervals are computed using bootstrapping (200 draws).

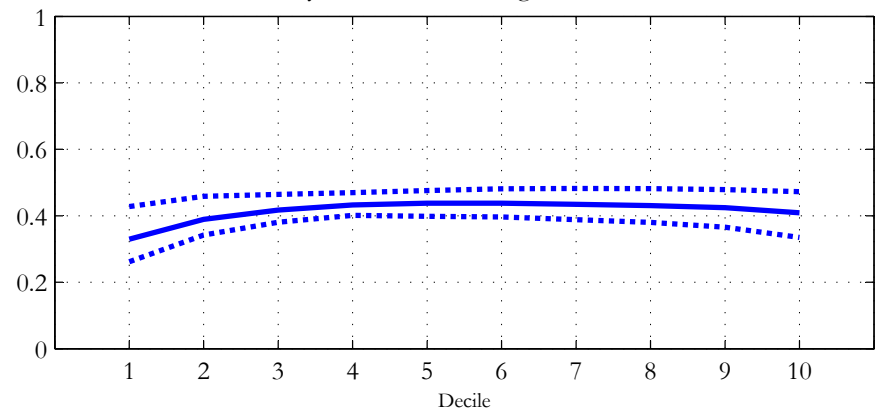
Figure S8. Probability of Being a High School Graduate by Age 30 - Females  
 i. By Decile of Cognitive and Noncognitive Factors



ii. By Decile of Cognitive Factor

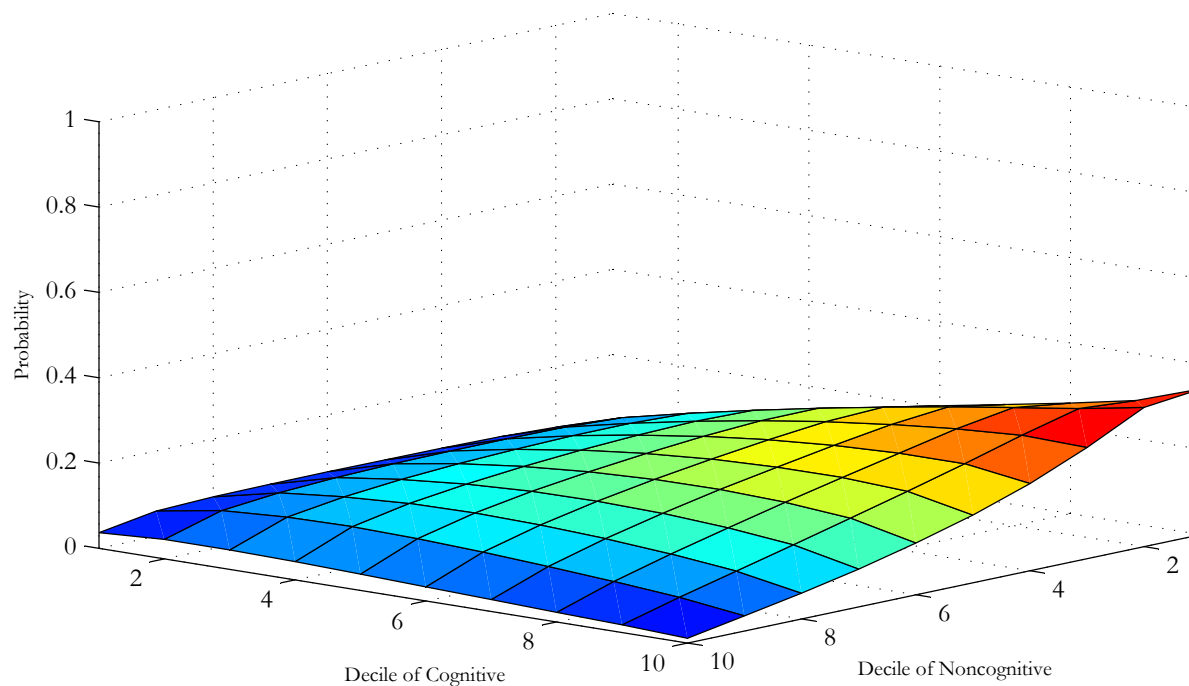


iii. By Decile of Noncognitive Factor

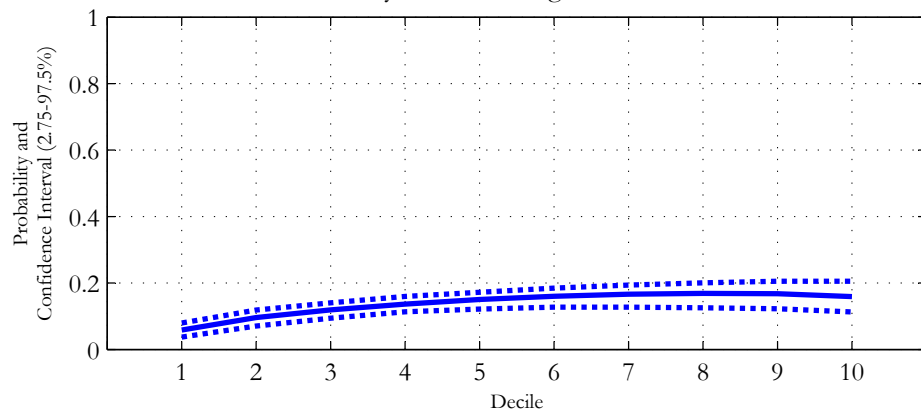


Notes: The data are simulated from the estimates of the model and our NLSY79 sample. We use the standard convention that higher deciles are associated with higher values of the variable. The confidence intervals are computed using bootstrapping (200 draws).

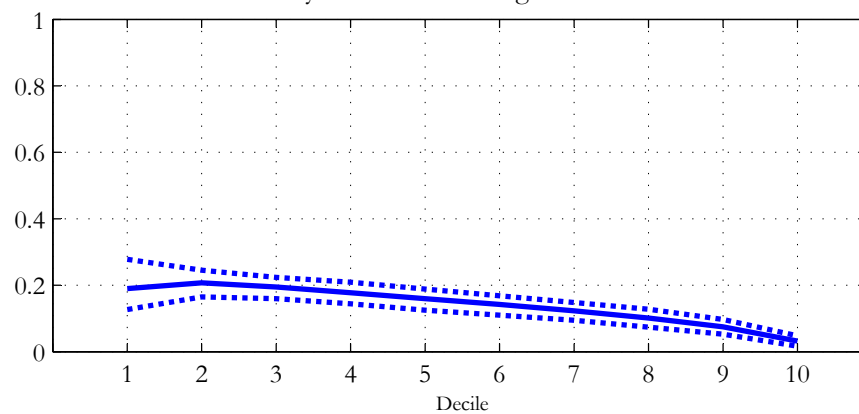
Figure S9. Probability of Attending Some College by Age 30 - Males  
 i. By Decile of Cognitive and Noncognitive Factors



ii. By Decile of Cognitive Factor

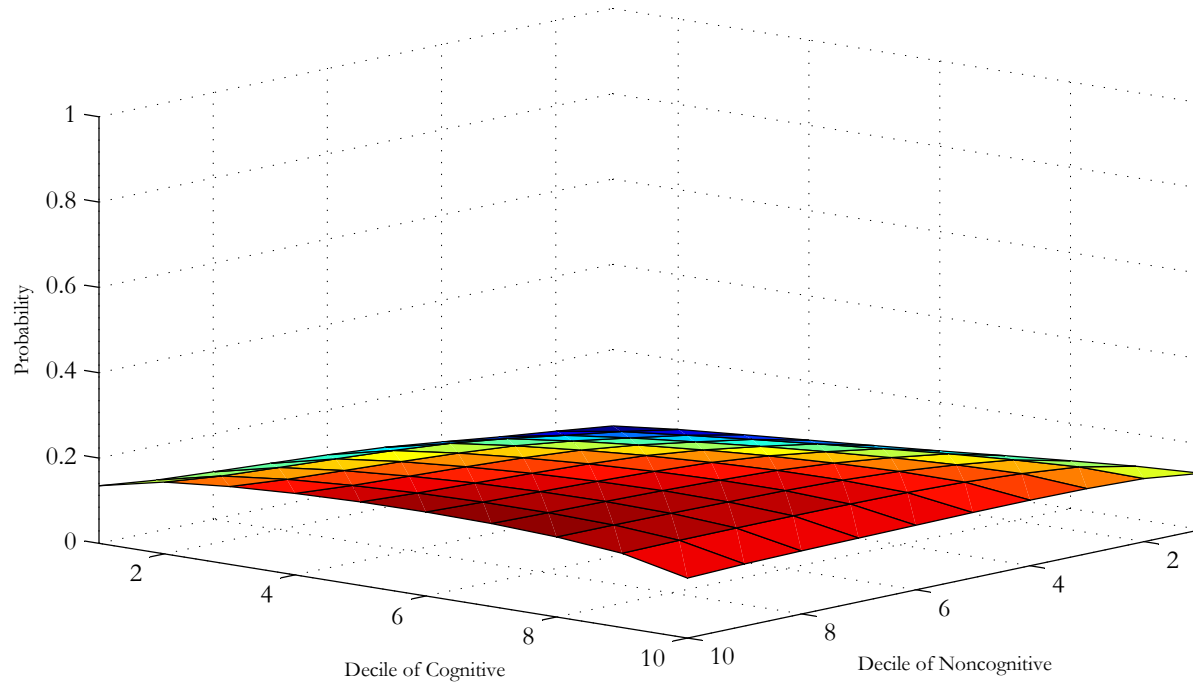


iii. By Decile of Noncognitive Factor

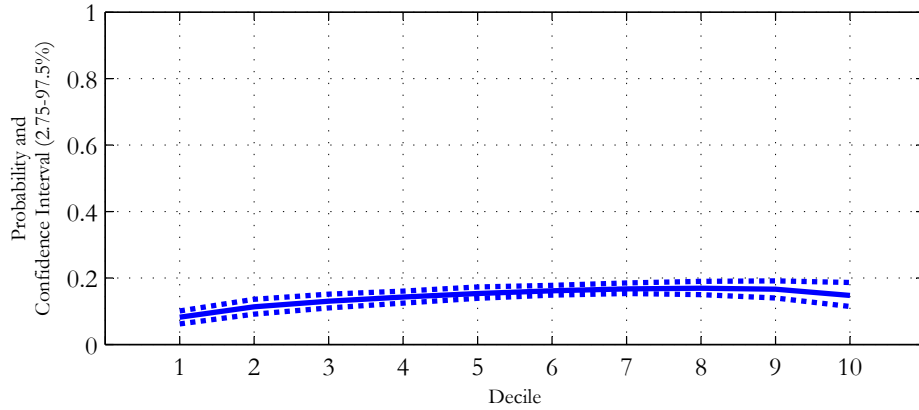


Notes: The data are simulated from the estimates of the model and our NLSY79 sample. We use the standard convention that higher deciles are associated with higher values of the variable. The confidence intervals are computed using bootstrapping (200 draws).

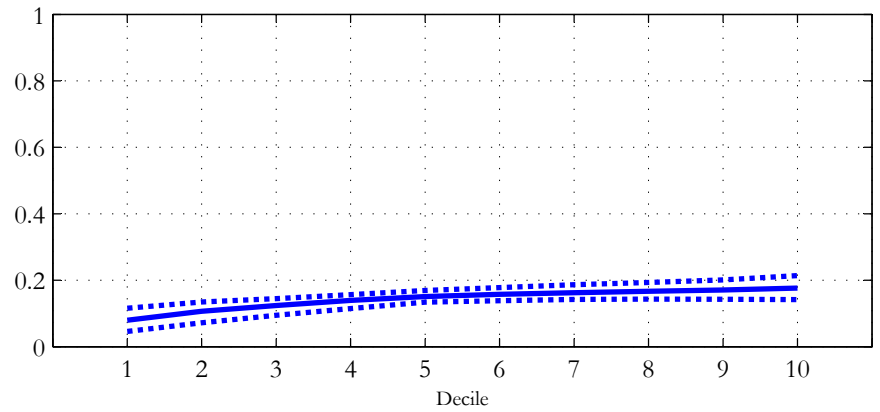
Figure S10. Probability of Attending Some College by Age 30 - Females  
 i. By Decile of Cognitive and Noncognitive Factors



ii. By Decile of Cognitive Factor

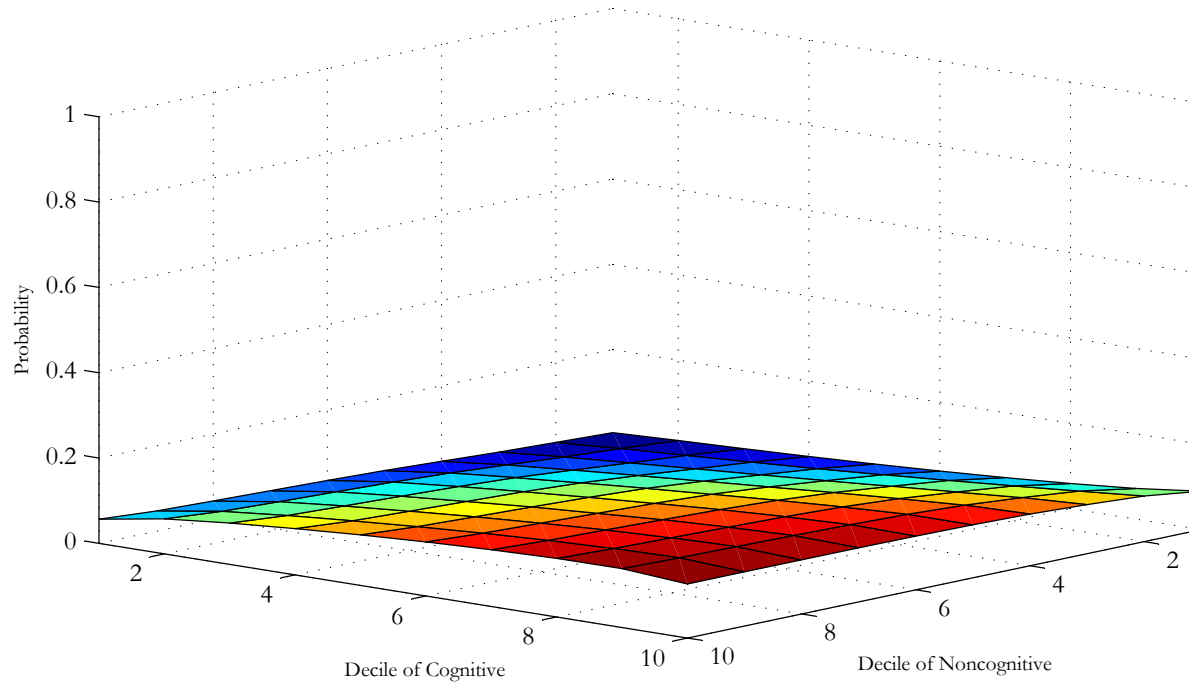


iii. By Decile of Noncognitive Factor

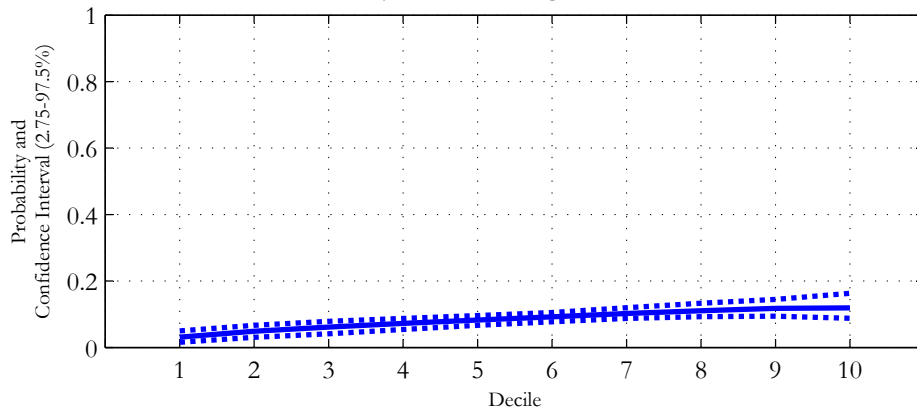


Notes: The data are simulated from the estimates of the model and our NLSY79 sample. We use the standard convention that higher deciles are associated with higher values of the variable. The confidence intervals are computed using bootstrapping (200 draws).

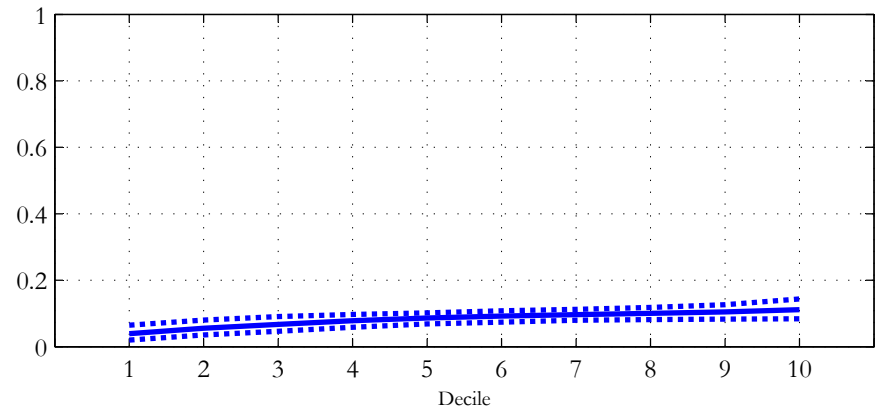
Figure S11. Probability of Being a 2-yr College Graduate by Age 30 - Females  
 i. By Decile of Cognitive and Noncognitive Factors



ii. By Decile of Cognitive Factor



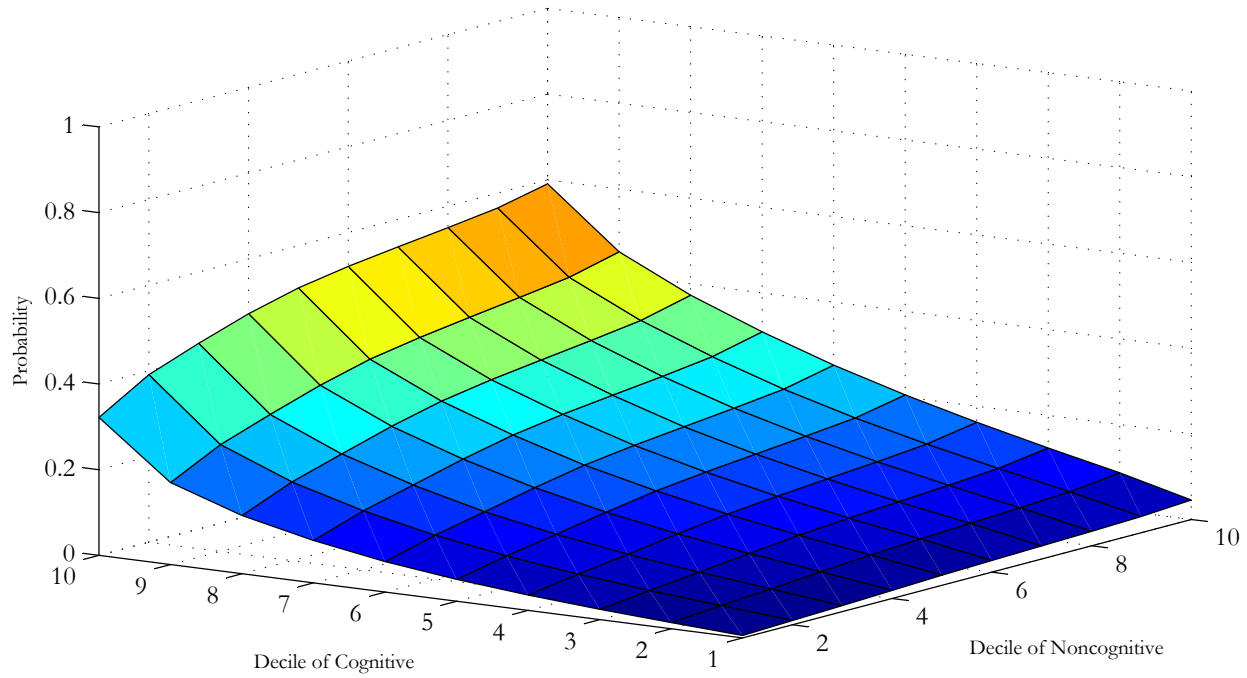
iii. By Decile of Noncognitive Factor



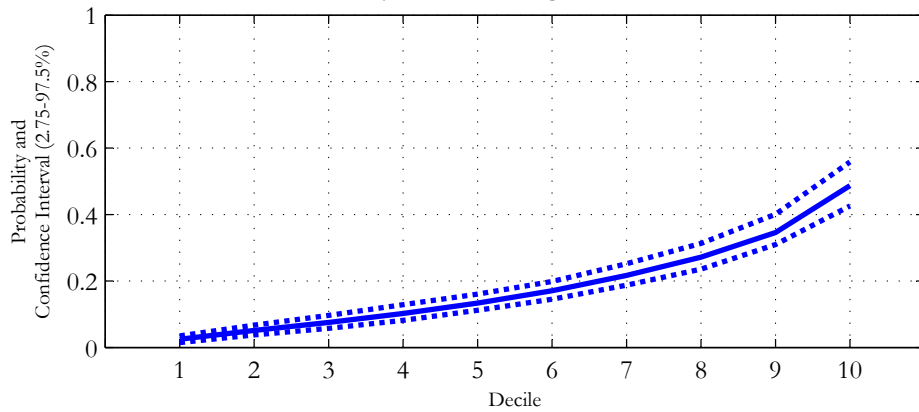
Notes: The data are simulated from the estimates of the model and our NLSY79 sample. We use the standard convention that higher deciles are associated with higher values of the variable. The confidence intervals are computed using bootstrapping (200 draws).



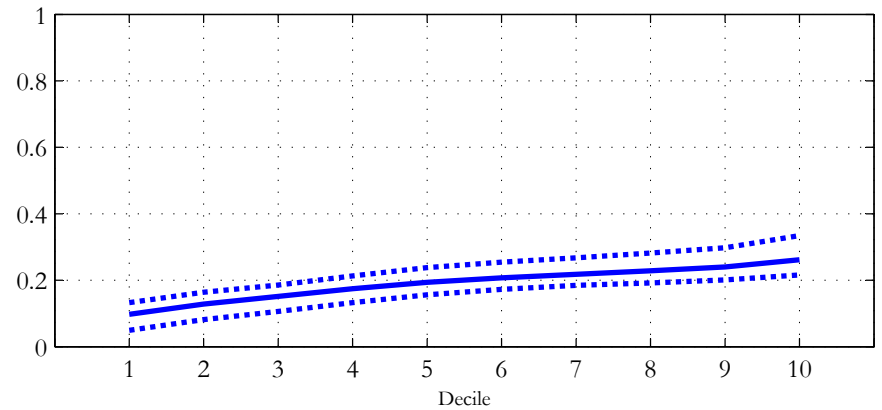
Figure S12. Probability of Being a 4-yr College Graduate by Age 30 - Females  
 i. By Decile of Cognitive and Noncognitive Factors



ii. By Decile of Cognitive Factor

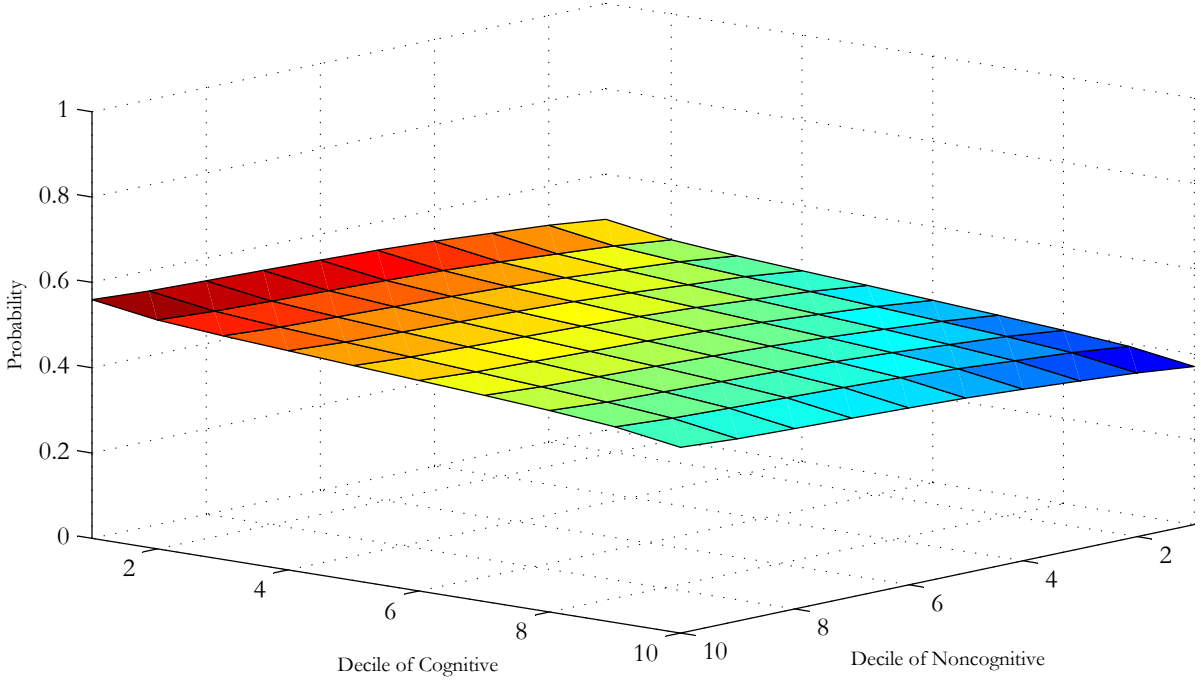


iii. By Decile of Noncognitive Factor

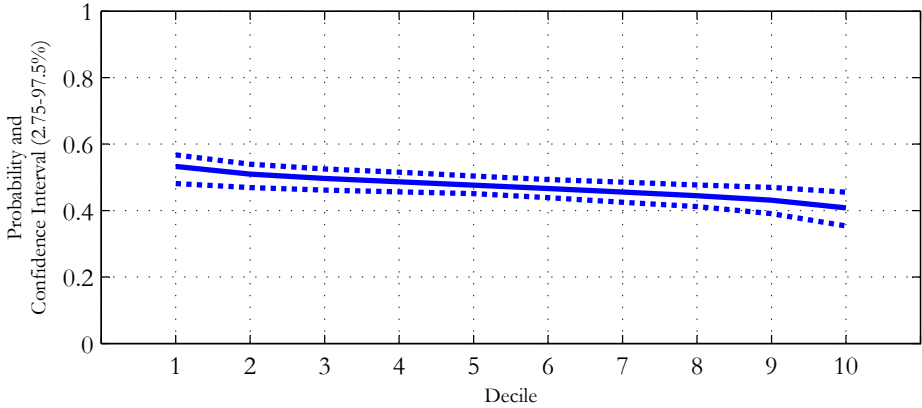


Notes: The data are simulated from the estimates of the model and our NLSY79 sample. We use the standard convention that higher deciles are associated with higher values of the variable. The confidence intervals are computed using bootstrapping (200 draws).

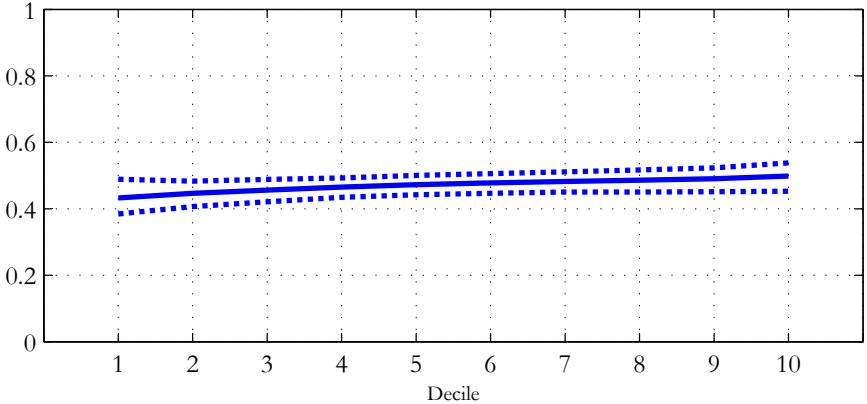
Figure S13. Probability of Smoking Marijuana during the Year 1979 - Females  
 i. By Decile of Cognitive and Noncognitive Factor



ii. By Decile of Cognitive Factor

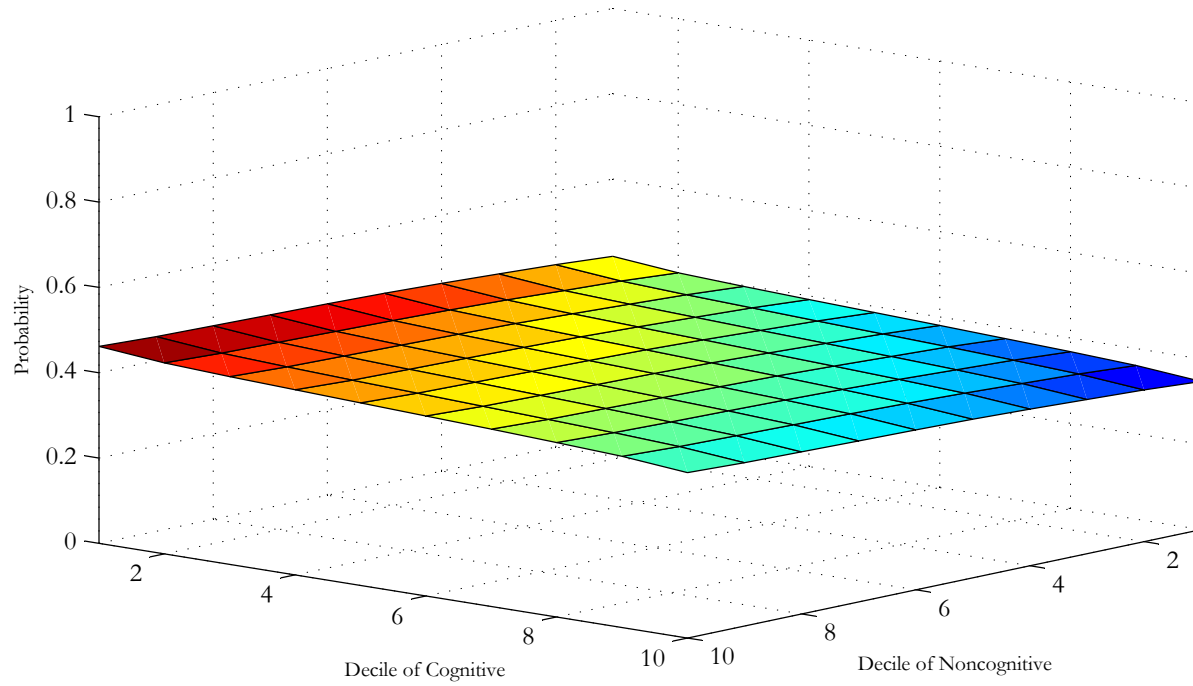


iii. By Decile of Noncognitive Factor

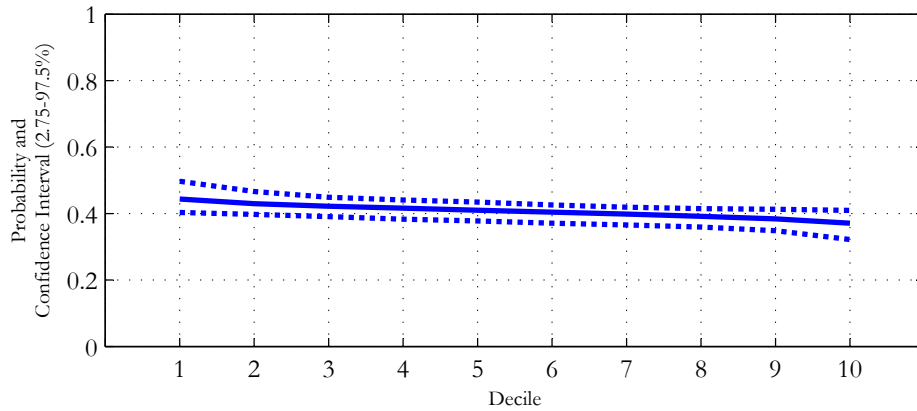


Notes: The data are simulated from the estimates of the model and our NLSY79 sample. We use the standard convention that higher deciles are associated with higher values of the variable. The confidence intervals are computed using bootstrapping (200 draws).

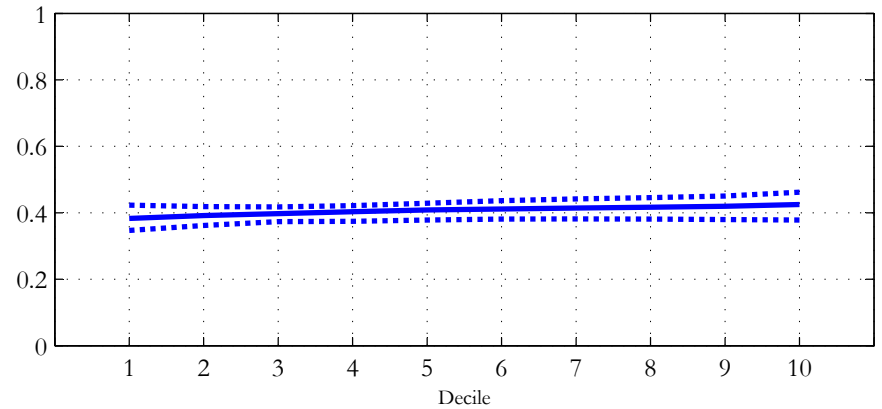
Figure S14. Probability of Participating in Illegal Activities during the Year 1979- Females  
 i. By Decile of Cognitive and Noncognitive Factor



ii. By Decile of Cognitive Factor

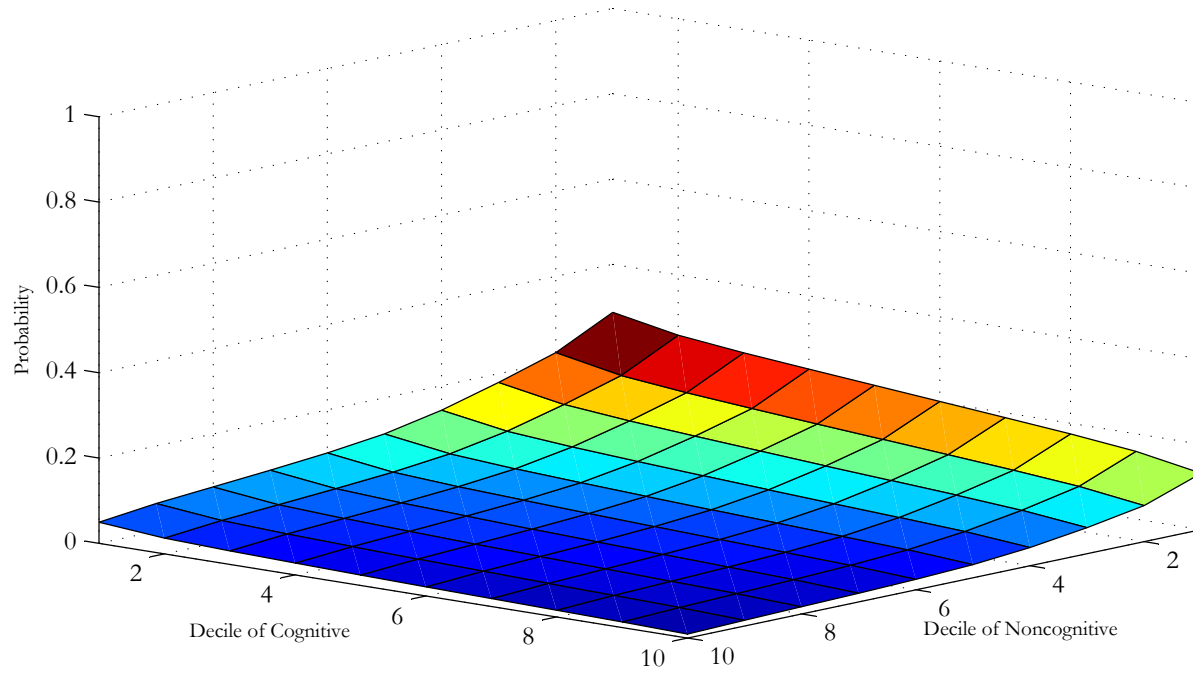


iii. By Decile of Noncognitive Factor

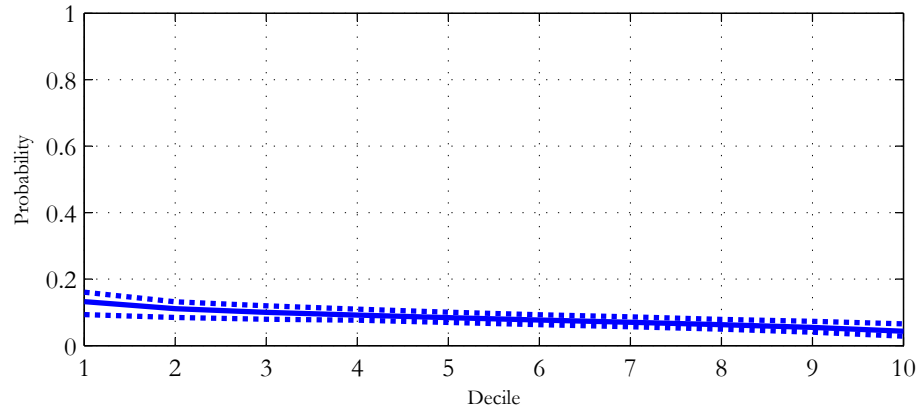


Notes: The data are simulated from the estimates of the model and our NLSY79 sample. We use the standard convention that higher deciles are associated with higher values of the variable. The confidence intervals are computed using bootstrapping (200 draws).

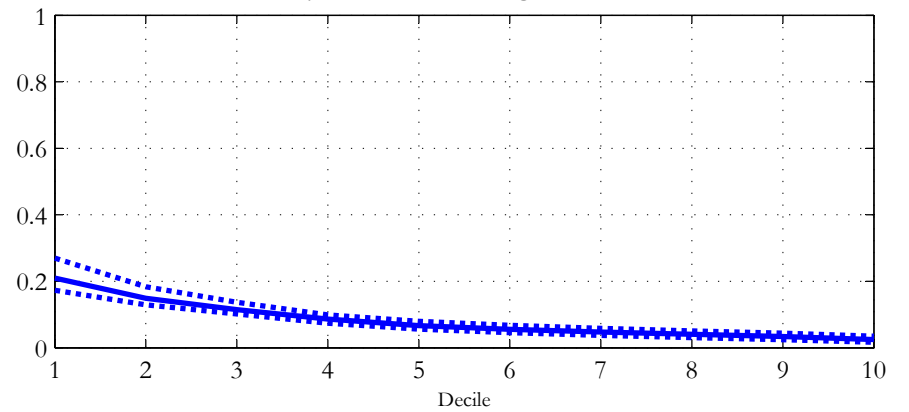
Figure S15. Probability Of Being Married With Child by Age 18- Females  
 i. By Decile of Cognitive and Noncognitive Factors



ii. By Decile of Cognitive Factor

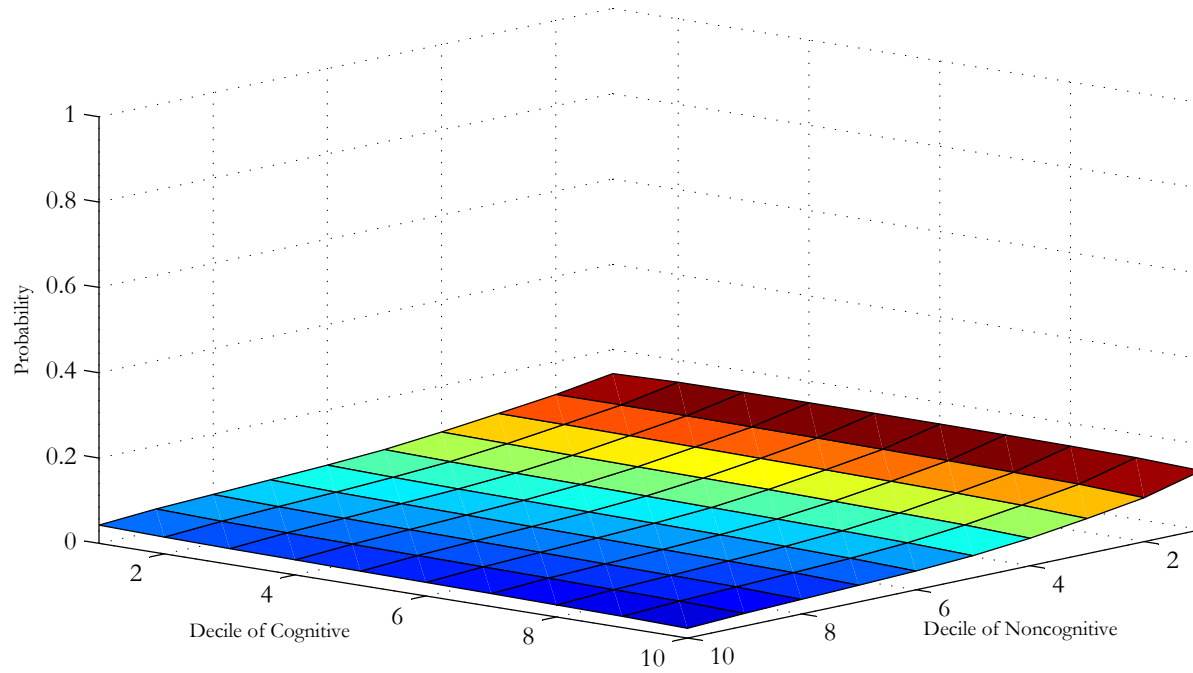


iii. By Decile of Noncognitive Factor

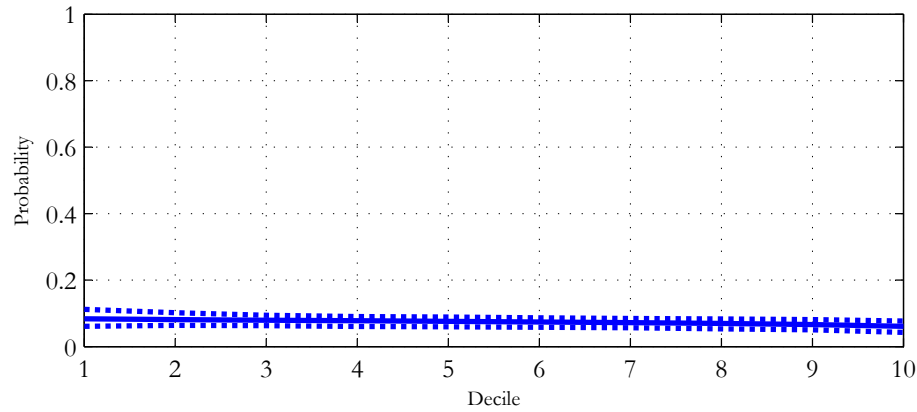


Notes: The data are simulated from the estimates of the model and our NLSY79 sample. We use the standard convention that higher deciles are associated with higher values of the variable. The confidence intervals are computed using bootstrapping (200 draws).

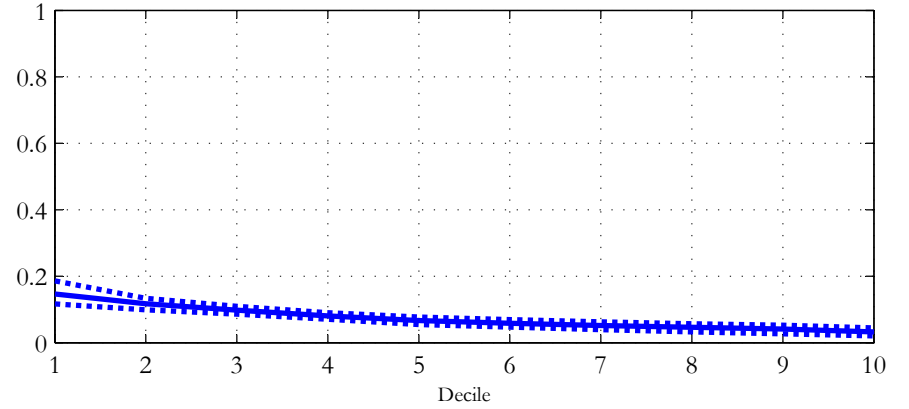
Figure S16. Probability Of Being Married With No Child by Age 18- Females  
 i. By Decile of Cognitive and Noncognitive Factors



ii. By Decile of Cognitive Factor

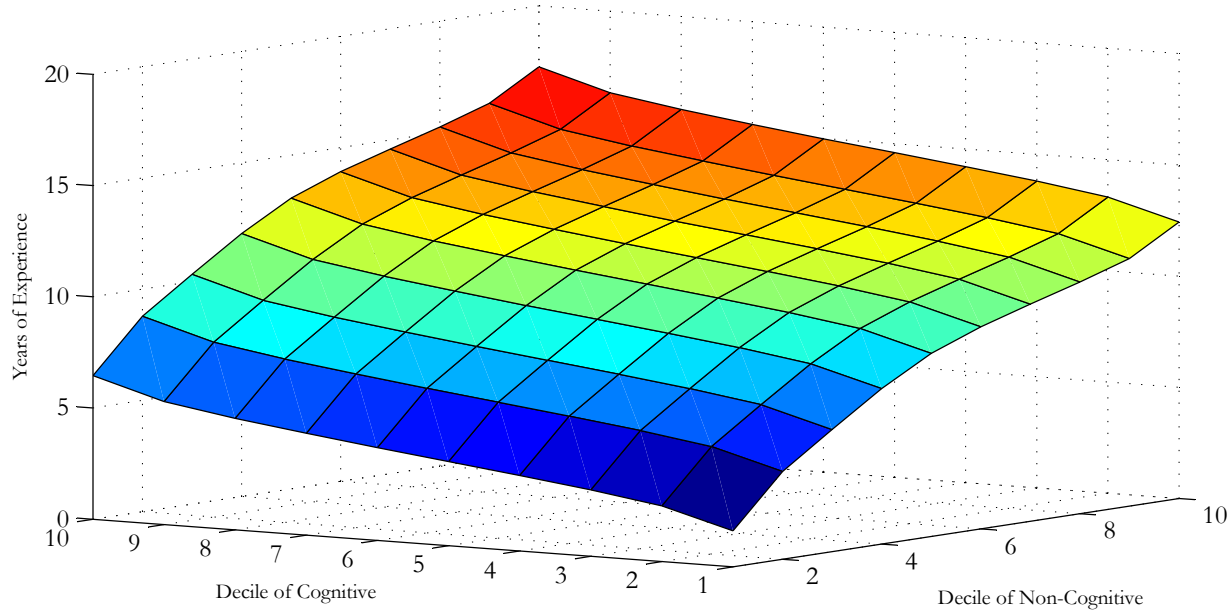


iii. By Decile of Noncognitive Factor

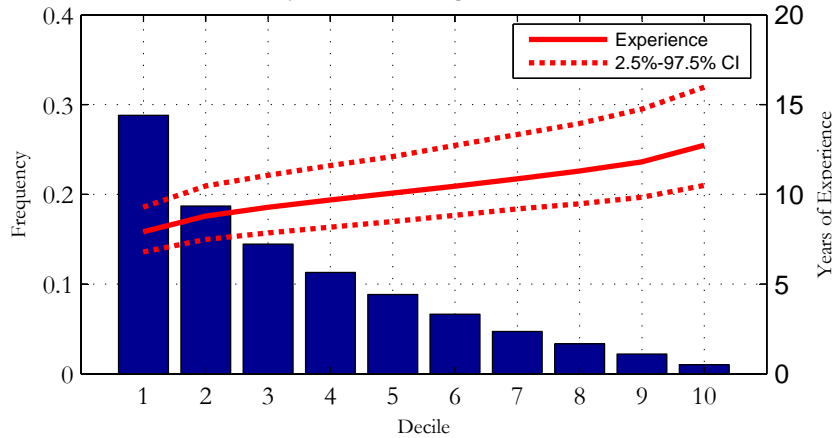


Notes: The data are simulated from the estimates of the model and our NLSY79 sample. We use the standard convention that higher deciles are associated with higher values of the variable. The confidence intervals are computed using bootstrapping (200 draws).

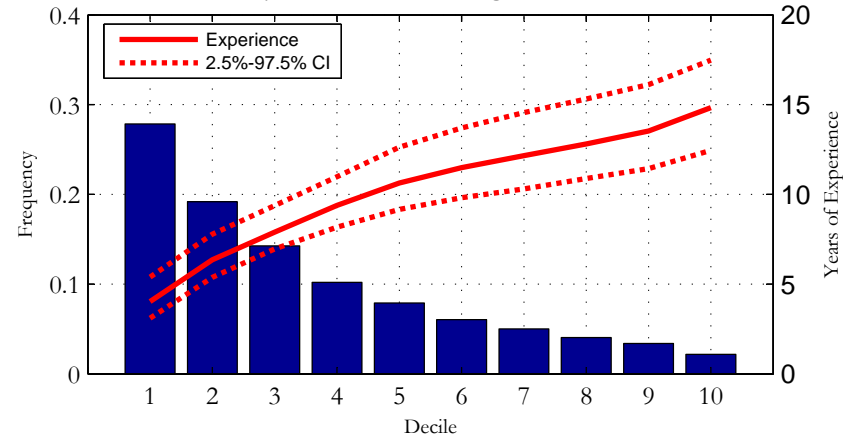
Figure S17. Mean Work Experience of High School Dropouts by Age 30 - Females  
 A. By Decile of Cognitive and Non-Cognitive Factors



B. By Decile of Cognitive Factor

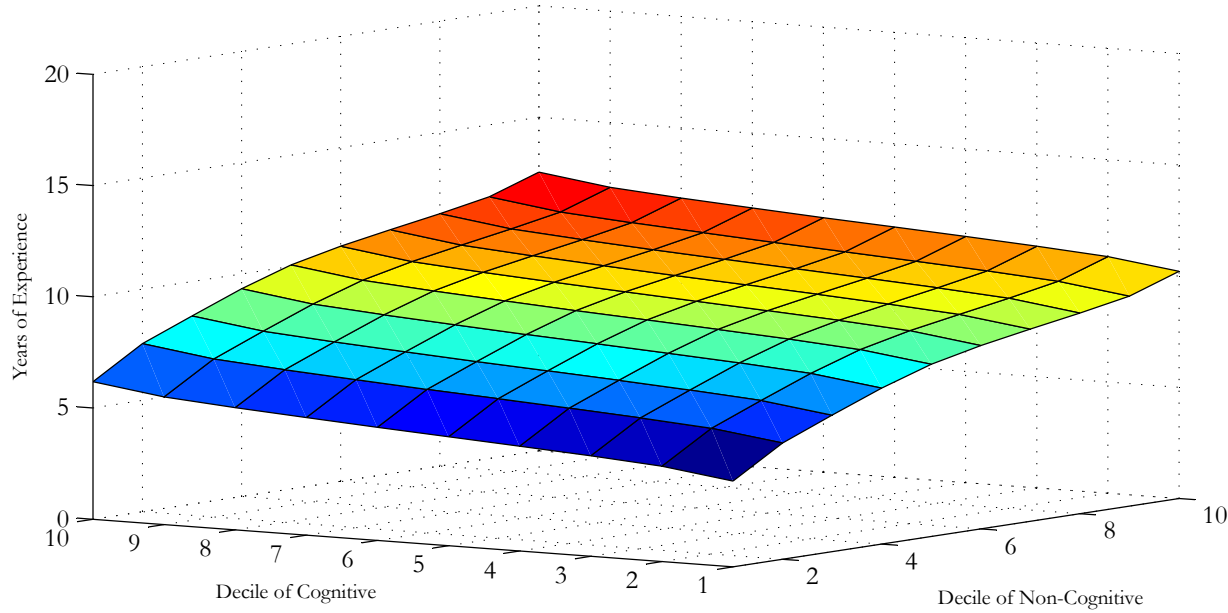


C. By Decile of Non-Cognitive Factor

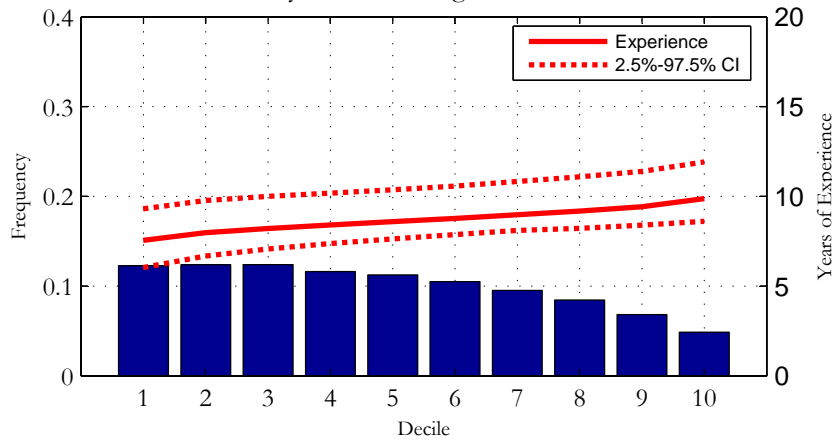


Notes: The data are simulated from the estimates of the model and our NLSY79 sample. We use the standard convention that higher deciles are associated with higher values of the variable. The confidence intervals are computed using bootstrapping (200 draws). Frequency indicates proportion of individuals with the indicated level of education whose abilities lie in the indicated decile of the distribution.

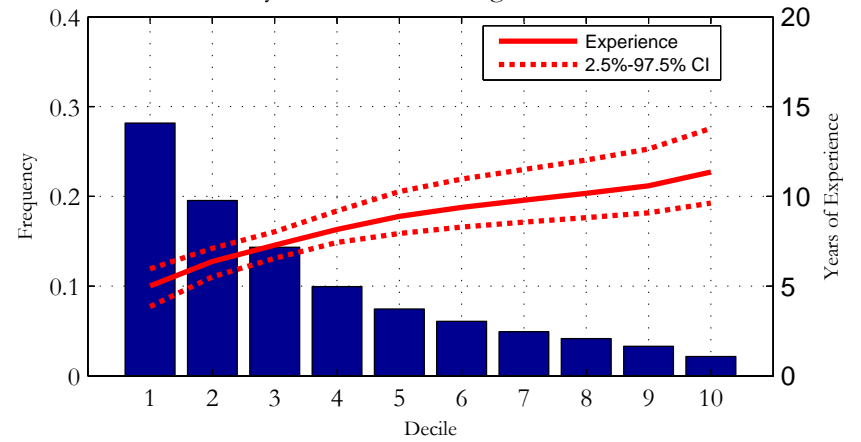
Figure S18. Mean Work Experience of GEDs by Age 30 - Females  
 A. By Decile of Cognitive and Non-Cognitive Factors



B. By Decile of Cognitive Factor

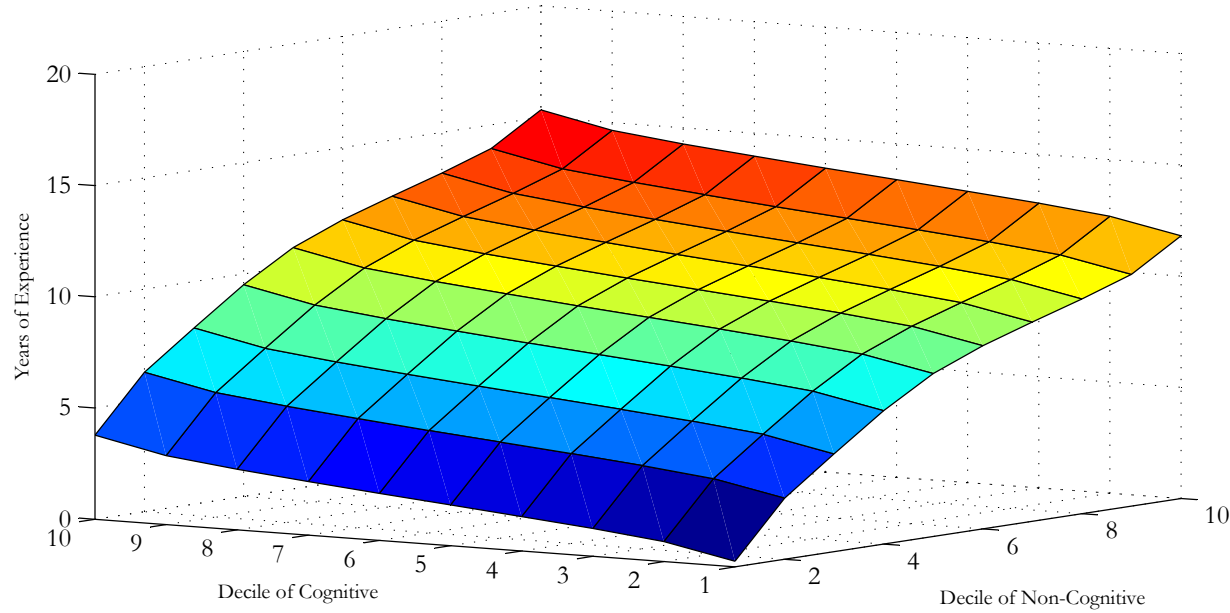


C. By Decile of Non-Cognitive Factor

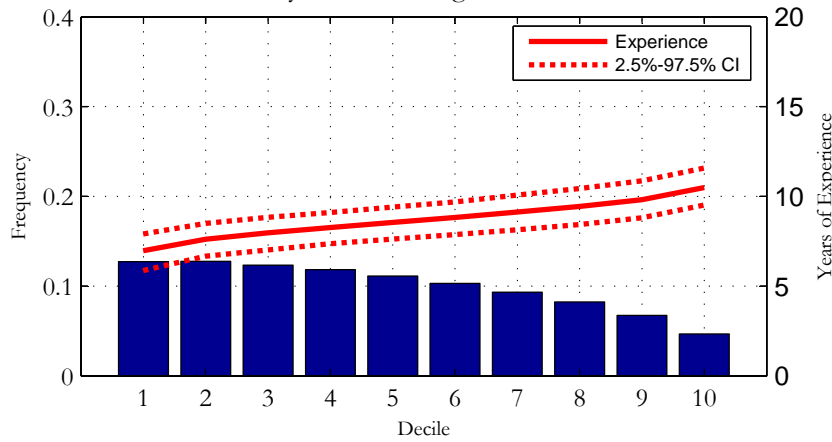


Notes: The data are simulated from the estimates of the model and our NLSY79 sample. We use the standard convention that higher deciles are associated with higher values of the variable. The confidence intervals are computed using bootstrapping (200 draws). Frequency indicates proportion of individuals with the indicated level of education whose abilities lie in the indicated decile of the distribution.

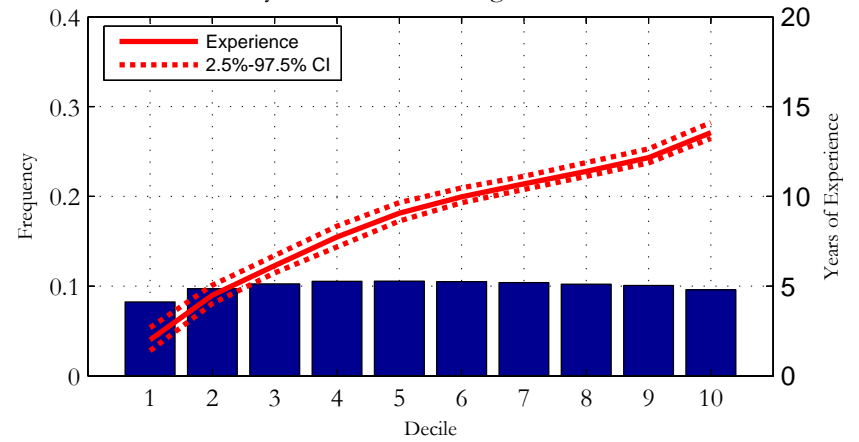
Figure S19. Mean Work Experience of High School Graduates by Age 30 - Females  
 A. By Decile of Cognitive and Non-Cognitive Factors



B. By Decile of Cognitive Factor



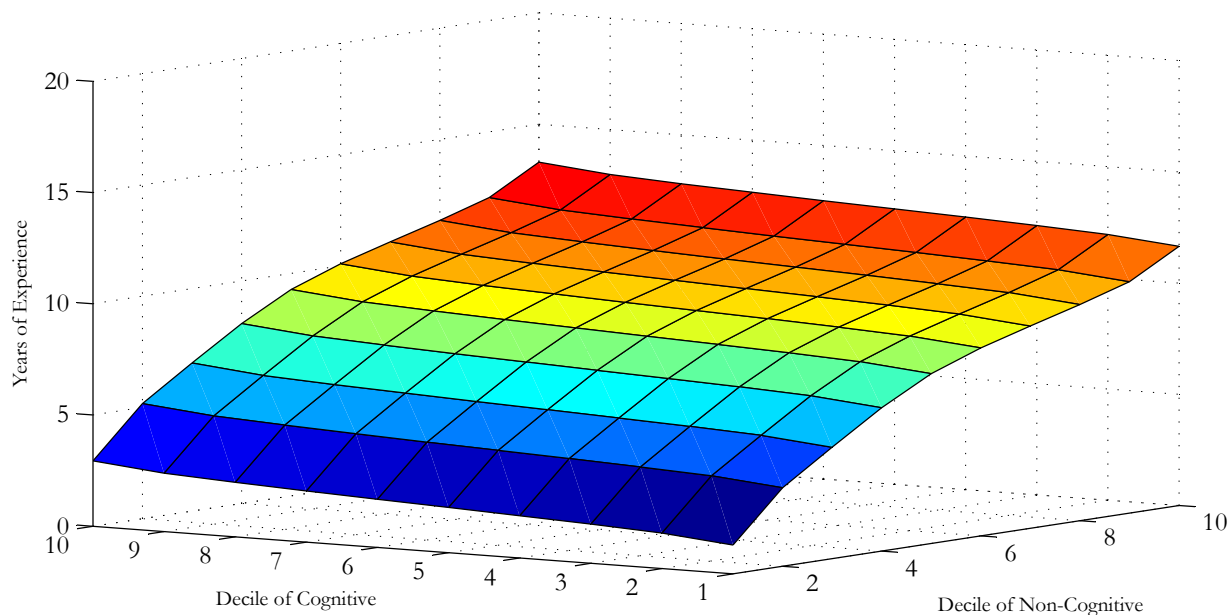
C. By Decile of Non-Cognitive Factor



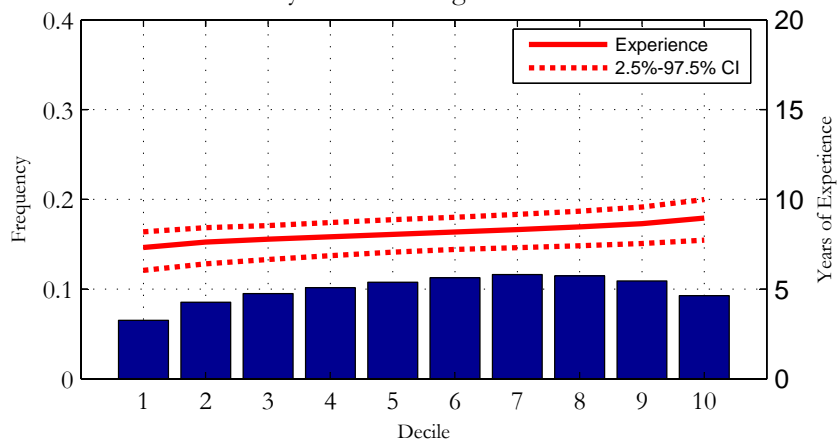
Notes: The data are simulated from the estimates of the model and our NLSY79 sample. We use the standard convention that higher deciles are associated with higher values of the variable. The confidence intervals are computed using bootstrapping (200 draws). Frequency indicates proportion of individuals with the indicated level of education whose abilities lie in the indicated decile of the distribution.



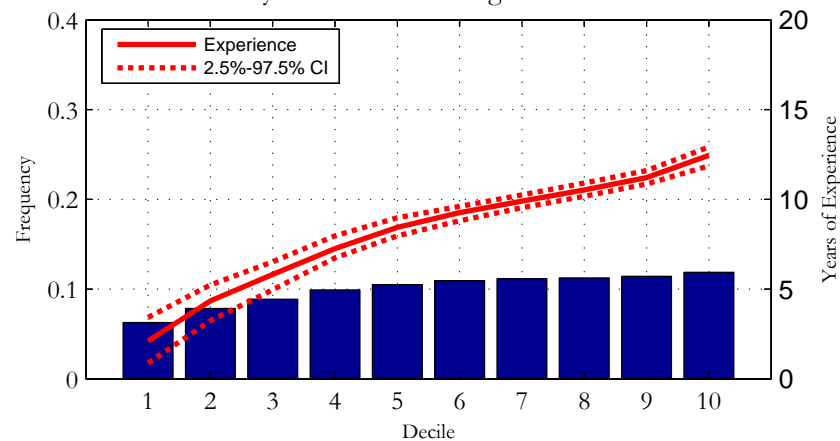
Figure S20. Mean Work Experience of Some College by Age 30 - Females  
 A. By Decile of Cognitive and Non-Cognitive Factors



B. By Decile of Cognitive Factor

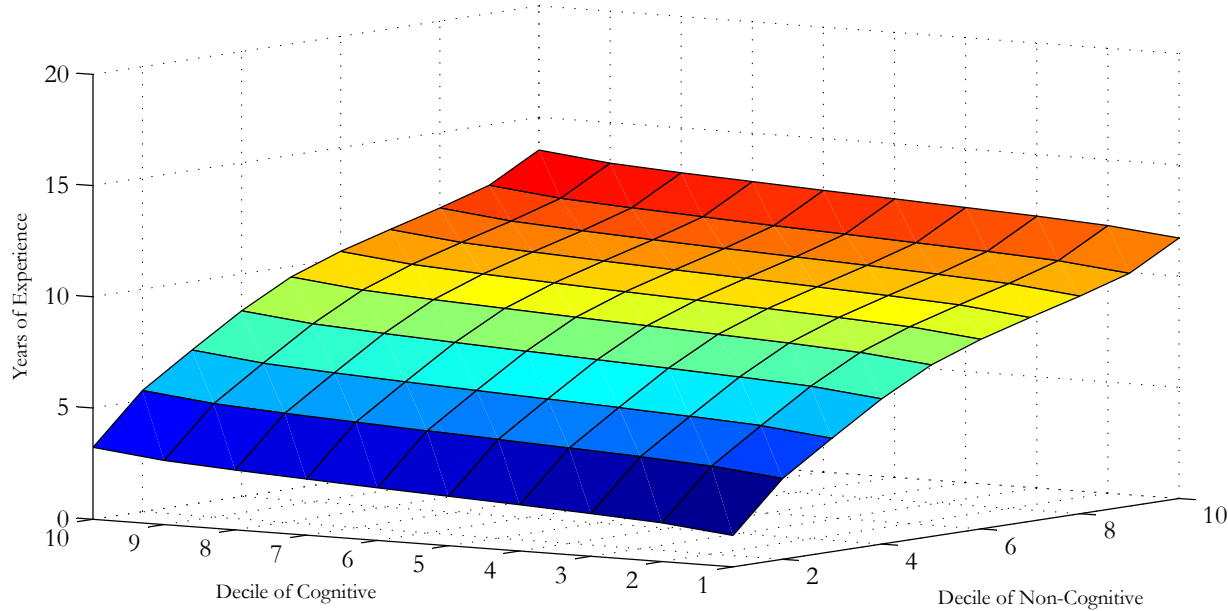


C. By Decile of Non-Cognitive Factor

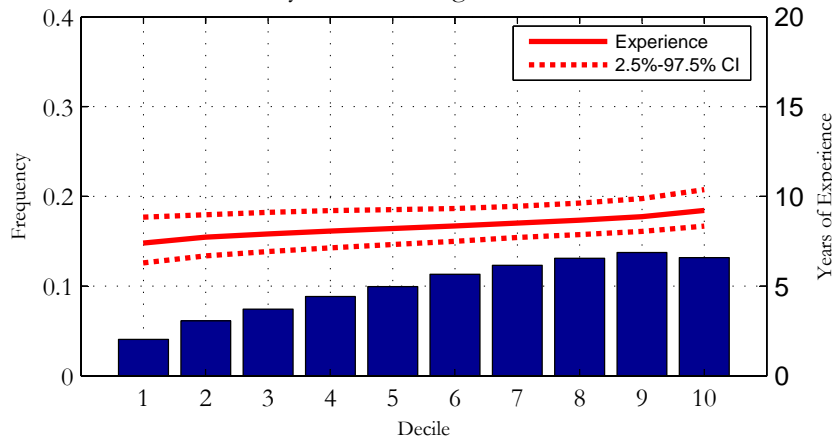


Notes: The data are simulated from the estimates of the model and our NLSY79 sample. We use the standard convention that higher deciles are associated with higher values of the variable. The confidence intervals are computed using bootstrapping (200 draws). Frequency indicates proportion of individuals with the indicated level of education whose abilities lie in the indicated decile of the distribution.

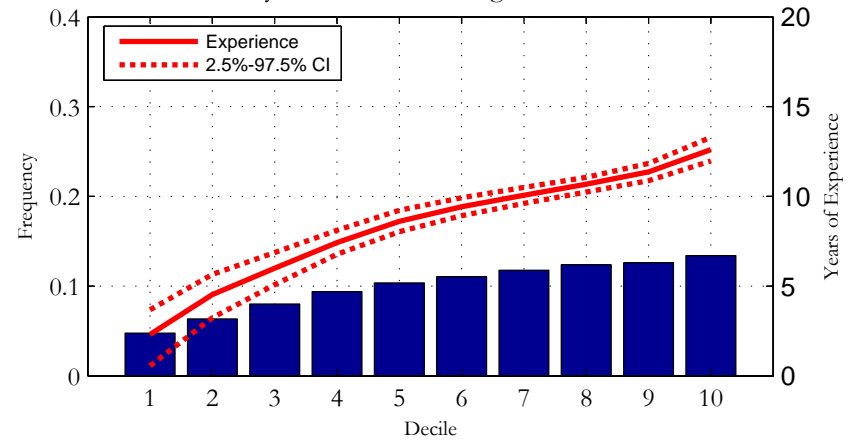
Figure S21. Mean Work Experience of 2-yr College Graduates by Age 30 - Females  
 A. By Decile of Cognitive and Non-Cognitive Factors



B. By Decile of Cognitive Factor

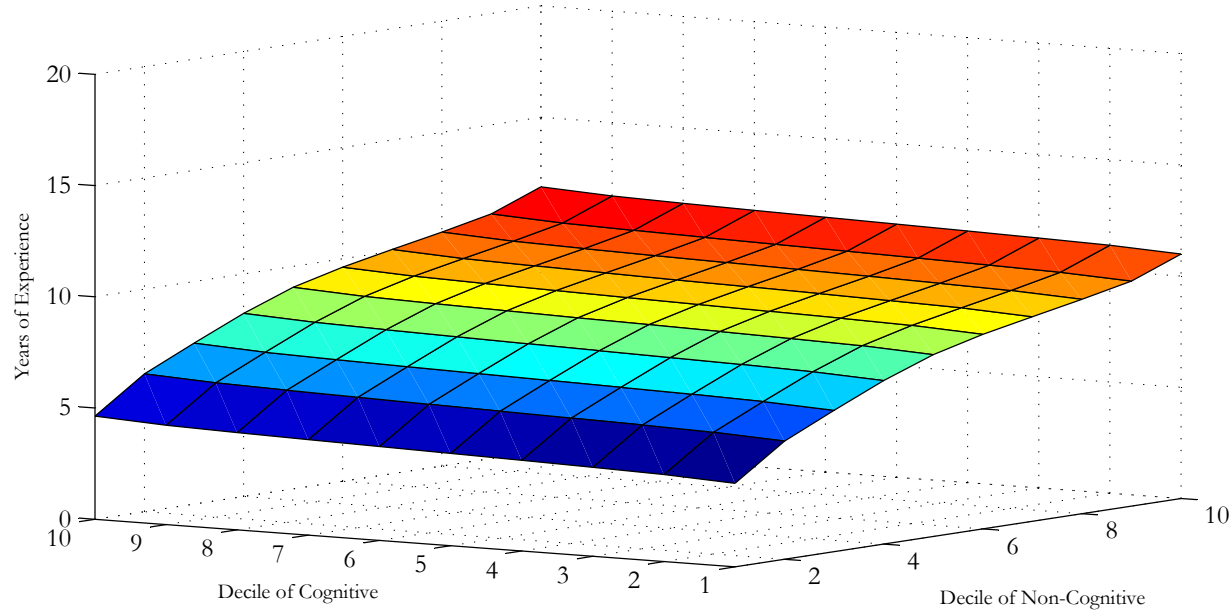


C. By Decile of Non-Cognitive Factor

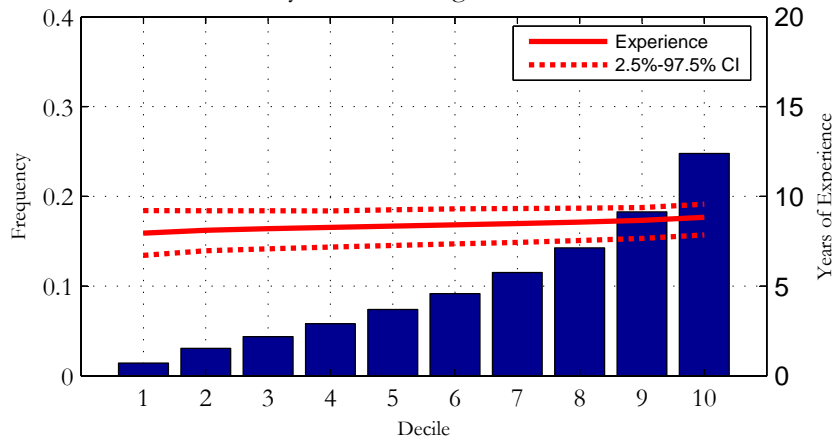


Notes: The data are simulated from the estimates of the model and our NLSY79 sample. We use the standard convention that higher deciles are associated with higher values of the variable. The confidence intervals are computed using bootstrapping (200 draws). Frequency indicates proportion of individuals with the indicated level of education whose abilities lie in the indicated decile of the distribution.

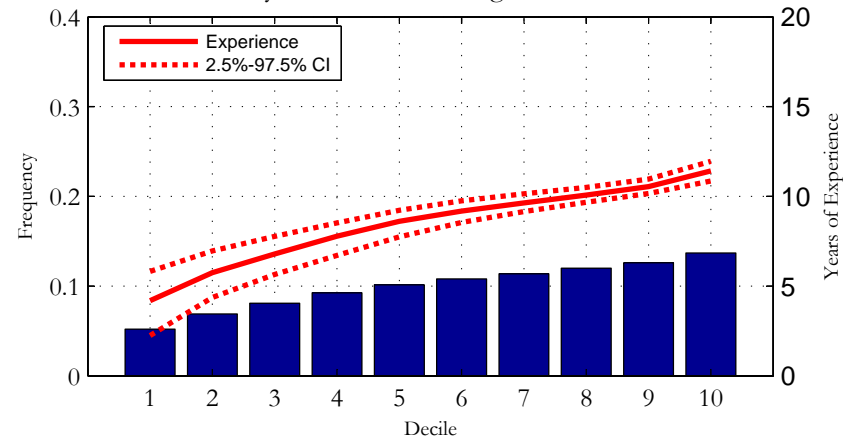
Figure S22. Mean Work Experience of 4-yr College Graduates by Age 30 - Females  
 A. By Decile of Cognitive and Non-Cognitive Factors



B. By Decile of Cognitive Factor



C. By Decile of Non-Cognitive Factor



Notes: The data are simulated from the estimates of the model and our NLSY79 sample. We use the standard convention that higher deciles are associated with higher values of the variable. The confidence intervals are computed using bootstrapping (200 draws). Frequency indicates proportion of individuals with the indicated level of education whose abilities lie in the indicated decile of the distribution.

**Table S1. Estimated Marginal Effects of the Cognitive and Noncognitive Measures for the Occupational, Schooling Behavioral Work Experience and Models** <sup>(a), (b),(c),(d)</sup>

Outcome (Model)	Males		Females	
	Cognitive	Noncognitive	Cognitive	Noncognitive
<i>A. Occupational</i> <sup>(e)</sup>				
Labor Force Participation	0.049 (0.007)	0.010 (0.007)	0.100 (0.012)	-0.005 (0.011)
White/Blue Collar	0.261 (0.016)	0.046 (0.014)	0.167 (0.015)	0.031 (0.013)
<i>B. Smoking</i> <sup>(g)</sup>				
	-0.094 (0.014)	-0.042 (0.012)	-0.116 (0.014)	-0.015 (0.012)
<i>C. Drug</i> <sup>(g)</sup>				
	-0.029 (0.014)	-0.023 (0.012)	-0.013 (0.014)	-0.024 (0.012)
<i>D. Jail</i> <sup>(g)</sup>				
	-0.021 (0.004)	-0.004 (0.003)		
<i>E. Illegal Index</i> <sup>(g)</sup>				
	-0.014 (0.014)	-0.047 (0.012)	0.014 (0.014)	-0.070 (0.012)
<b>Multinomial Probits</b>				
	Cognitive	Noncognitive	Cognitive	Noncognitive
<i>F. Schooling Choice</i> <sup>(f)</sup>				
Dropouts	-0.131 (0.011)	-0.011 (0.006)	-0.078 (0.008)	-0.016 (0.004)
GED	-0.056 (0.010)	-0.016 (0.008)	-0.050 (0.009)	-0.026 (0.007)
Highschool Grad.	-0.145 (0.018)	-0.028 (0.013)	-0.175 (0.017)	-0.024 (0.013)
Some College	0.072 (0.014)	0.009 (0.011)	0.058 (0.013)	0.017 (0.010)
2-yr College Grad.	0.042 (0.009)	0.009 (0.007)	0.057 (0.011)	0.021 (0.008)
<i>G. Fertility Choice</i> <sup>(g)</sup>				
Married/Child			-0.024 (0.006)	-0.021 (0.005)
Married/No Child			-0.014 (0.006)	0.003 (0.005)
Single/Child			-0.030 (0.005)	-0.005 (0.004)
<b>Linear Model</b>				
	Cognitive	Noncognitive	Cognitive	Noncognitive
<i>H. Work Experience</i> <sup>(g)</sup>				
Dropouts	0.630 (0.243)	0.383 (0.180)	0.843 (0.255)	-0.429 (0.247)
GED	0.873 (0.272)	0.361 (0.260)	0.566 (0.280)	0.332 (0.255)
Highschool Grad.	0.358 (0.093)	0.279 (0.087)	0.874 (0.120)	0.160 (0.115)
Some College	0.302 (0.190)	-0.227 (0.159)	0.525 (0.194)	-0.101 (0.158)
2-yr College Grad.	0.151 (0.285)	0.155 (0.240)	0.506 (0.236)	-0.220 (0.201)
4-yr College Grad.	0.098 (0.151)	0.021 (0.103)	0.027 (0.144)	-0.006 (0.108)

Notes: (a) The cognitive measure represents the standardized average over the raw ASVAB scores (arithmetic reasoning, word knowledge, paragraph comprehension, numerical operations and coding speed); (b) The noncognitive measure is computed as a (standardized) average of the Rosenberg Self-esteem Scale and Rotter Internal-External Locus of Control Scale; (c) We exclude the oversample of blacks, Hispanics and poor whites, the military sample, and those currently enrolled in college. Standard errors in parentheses; (d) Marginal effects in this table represents the derivative of the probabilities with respect to the variables evaluated at the mean; (e) The model includes a set of cohort dummies, local labor market conditions (unemployment rate), and the region of residence; (f) The model includes a set of cohort dummies, local labor market conditions (unemployment rate), the region of residence, and family background; (g) The model includes a set of cohort dummies, and family background.

Table S2. Factor Analysis of the Test Scores (Cognitive Skills)  
and Attitude Scale Items (Noncognitive Skills)<sup>(a),(b)</sup>  
Sample from NLSY79

Factor#	Males		Females	
	Eigenvalue	Proportion	Eigenvalue	Proportion
<b>Cognitive Skills <sup>(a)</sup></b>				
1	<b>3.8290</b>	<b>76.58%</b>	<b>3.6087</b>	<b>72.17%</b>
2	0.4464	8.93%	0.5839	11.68%
3	0.3896	7.79%	0.4231	8.46%
4	0.1716	3.43%	0.1967	3.93%
5	0.1635	3.27%	0.1876	3.75%
<b>Noncognitive Skills <sup>(b)</sup></b>				
1	<b>4.2925</b>	<b>30.66%</b>	<b>4.3882</b>	<b>31.34%</b>
2	<b>1.2814</b>	<b>9.15%</b>	<b>1.2658</b>	<b>9.04%</b>
3	<b>1.1561</b>	<b>8.26%</b>	<b>1.1886</b>	<b>8.49%</b>
4	0.9653	6.90%	0.9426	6.73%
5	0.8893	6.35%	0.8610	6.15%
6	0.8493	6.07%	0.8291	5.92%
7	0.8261	5.90%	0.8279	5.91%
8	0.7317	5.23%	0.7162	5.12%
9	0.6750	4.82%	0.6515	4.65%
10	0.5981	4.27%	0.5944	4.25%
11	0.4814	3.44%	0.4626	3.30%
12	0.4437	3.17%	0.4414	3.15%
13	0.4134	2.95%	0.4374	3.12%
14	0.3966	2.83%	0.3933	2.81%

Note: (a) Cognitive Ability is measured by five different ASVAB tests. ASVAB1 represents the arithmetic reasoning test, ASVAB 2 represents the word knowledge test, ASVAB3 represents the paragraph comprehension test, ASVAB4 represents the mathematical knowledge test and ASVAB5 represents the coding speed test. (b) Noncognitive ability is measured by two different scales: the locus of control scale and the self-esteem scale. The locus of control scale is based on the four-item abbreviated version of the Rotter Internal-External Locus of Control Scale. This scale is designed to measure the extent to which individuals believe they have control over their lives through self-motivation or self-determination (internal control) as opposed to the extent that the environment controls their lives (external control). The self-esteem scale is based on the 10-item Rosenberg Self-Esteem Scale. This scale describes a degree of approval toward oneself.

**Table S3. Correlations of Test Scores (Cognitive Skills) and Attitude Scales (Noncognitive Skills)  
Age 30 Sample -- NLSY79**

<b>A. Males</b>							
i. Raw Scores							
	ASVAB1	ASVAB2	ASVAB3	ASVAB4	ASVAB5	Rosenberg	Rotter
ASVAB1	1						
ASVAB2	0.7302	1					
ASVAB3	0.7298	0.8148	1				
ASVAB4	0.8331	0.6931	0.6905	1			
ASVAB5	0.6241	0.5904	0.591	0.6206	1		
Rosenberg	0.2878	0.3363	0.3265	0.2733	0.2631	1	
Rotter	0.2484	0.2705	0.2474	0.2283	0.2016	0.2927	1
ii. Residualized Scores <sup>(*)</sup>							
	ASVAB1	ASVAB2	ASVAB3	ASVAB4	ASVAB5	Rosenberg	Rotter
ASVAB1	1						
ASVAB2	0.5587	1					
ASVAB3	0.5821	0.7036	1				
ASVAB4	0.7462	0.5223	0.5336	1			
ASVAB5	0.4439	0.3846	0.4093	0.4528	1		
Rosenberg	0.1505	0.2137	0.2029	0.1187	0.13	1	
Rotter	0.1204	0.1472	0.1251	0.0929	0.0713	0.2202	1
<b>B. Females</b>							
i. Raw Scores							
	ASVAB1	ASVAB2	ASVAB3	ASVAB4	ASVAB5	Rosenberg	Rotter
ASVAB1	1						
ASVAB2	0.7024	1					
ASVAB3	0.6729	0.7809	1				
ASVAB4	0.8192	0.6615	0.6286	1			
ASVAB5	0.4893	0.5215	0.5349	0.4737	1		
Rosenberg	0.2868	0.3342	0.3041	0.2798	0.2524	1	
Rotter	0.2949	0.3143	0.2734	0.2781	0.2141	0.3136	1
ii. Residualized Scores <sup>(*)</sup>							
	ASVAB1	ASVAB2	ASVAB3	ASVAB4	ASVAB5	Rosenberg	Rotter
ASVAB1	1						
ASVAB2	0.5351	1					
ASVAB3	0.5149	0.6407	1				
ASVAB4	0.7353	0.5086	0.479	1			
ASVAB5	0.3202	0.3246	0.366	0.329	1		
Rosenberg	0.1528	0.2013	0.1791	0.1449	0.1438	1	
Rotter	0.1794	0.1798	0.1454	0.1731	0.0998	0.2337	1

Note: Cognitive Ability is measured by five different ASVAB tests. ASVAB1 represents the arithmetic reasoning test, ASVAB 2 represents the word knowledge test, ASVAB3 represents the paragraph comprehension test, ASVAB4 represents the mathematical knowledge test and ASVAB5 represents the coding speed test. Noncognitive ability is measured by two different scales: the locus of control scale and the self-esteem scale. The locus of control scale is based on the four-item abbreviated version of the Rotter Internal-External Locus of Control Scale. This scale is designed to measure the extent to which individuals believe they have control over their lives through self-motivation or self-determination (internal control) as opposed to the extent that the environment controls their lives (external control). The self-esteem scale is based on the 10-item Rosenberg Self-Esteem Scale. This scale describes a degree of approval toward oneself. (\*) All test scores are residualized by running an ordinary least squares regression of the standardized test score on family background, cohort dummies, and schooling at the time of the test dummies.

Table S4. Estimates of the Model of Cognitive vs. Noncognitive Skills

Log of Hourly Wage

Sample from the NLSY79--Males at age 30<sup>(a),(b),(c)</sup>

Variables	Schooling Level					
	HS Dropout	GED	HS Graduate	Some College, No Degree	2-Year College Degree	4-Year College Degree
Black (Dummy)	-0.219 (0.067)	-0.295 (0.098)	-0.354 (0.052)	-0.265 (0.099)	-0.498 (0.206)	-0.133 (0.085)
Hispanic (Dummy)	-0.346 (0.083)	-0.161 (0.134)	-0.088 (0.062)	-0.249 (0.119)	-0.404 (0.242)	-0.047 (0.126)
Constant	2.287 (0.126)	2.585 (0.269)	2.612 (0.077)	2.783 (0.160)	2.824 (0.308)	2.545 (0.137)
Cognitive Factor (Loading)	0.113 (0.076)	0.175 (0.107)	0.259 (0.041)	0.069 (0.086)	0.039 (0.138)	0.296 (0.075)
Noncognitive Factor (Loading)	0.424 (0.092)	0.357 (0.117)	0.360 (0.059)	0.401 (0.110)	0.368 (0.209)	-0.060 (0.175)
Precision	1.000 (0.000)	1.000 (0.000)	1.000 (0.000)	1.000 (0.000)	1.000 (0.000)	1.000 (0.000)

Notes: (a) We exclude the oversample of blacks, Hispanics, poor whites, the military sample, and those currently enrolled in college. (b) The hourly wage for each individual is computed as the average of their hourly wages at ages 29, 30, and 31. (c) The model also includes a set of cohort dummies, local labor market conditions (unemployment rate), and variables controlling for characteristics of the regions of residence.

Table S5. Estimates of the Model of Cognitive vs. Noncognitive Skills

## Log of Hourly Wage

Sample from the NLSY79--Females at age 30<sup>(a),(b),(c)</sup>

Variables	Schooling Level					
	HS Dropout	GED	HS Graduate	Some College, No Degree	2-Year College Degree	4-Year College Degree
Black (Dummy)	-0.181 (0.104)	-0.229 (0.109)	-0.103 (0.051)	-0.162 (0.073)	-0.302 (0.099)	-0.209 (0.092)
Hispanic (Dummy)	-0.130 (0.113)	-0.356 (0.164)	0.025 (0.062)	-0.045 (0.119)	-0.297 (0.120)	-0.042 (0.107)
Constant	2.014 (0.210)	1.626 (0.283)	2.210 (0.076)	2.184 (0.142)	2.165 (0.162)	2.359 (0.121)
Cognitive Factor (Loading)	0.322 (0.125)	0.020 (0.137)	0.341 (0.049)	0.093 (0.084)	0.206 (0.096)	0.290 (0.066)
Noncognitive Factor (Loading)	0.208 (0.103)	0.242 (0.153)	0.564 (0.056)	0.569 (0.116)	0.279 (0.145)	0.379 (0.103)
Precision	1.000 (0.000)	1.000 (0.000)	1.000 (0.000)	1.000 (0.000)	1.000 (0.000)	1.000 (0.000)

Notes: (a) We exclude the oversample of blacks, Hispanics, poor whites, the military sample, and those currently enrolled in college. (b) The hourly wage for each individual is computed as the average of their hourly wages at ages 29, 30, and 31. (c) The model also includes a set of cohort dummies, local labor market conditions (unemployment rate), and variables controlling for characteristics of the regions of residence.



Table S6. Estimates of the Model of Cognitive vs. Noncognitive Skills  
Employment and Occupational Choices  
Sample from the NLSY79 - Males at age 30<sup>(a)</sup>

Variables <sup>(d)</sup>	Employment <sup>(b)</sup>	Occupation <sup>(c)</sup>
Black (Dummy)	-0.622 (0.127)	-0.675 (0.123)
Hispanic (Dummy)	-0.527 (0.161)	-0.132 (0.150)
Constant	2.235 (0.250)	-0.282 (0.182)
Cognitive Factor (Loading)	0.503 (0.108)	1.242 (0.103)
Noncognitive Factor (Loading)	1.759 (0.150)	1.156 (0.138)
Precision	1.000 (0.000)	1.000 (0.000)

Notes: (a) We exclude the oversample of blacks, Hispanics, poor whites, the military sample, and those currently enrolled in college. (b) The employment decision is estimated using a probit model. The dependent variable takes a value of 1 if the individual reports that he worked during the week prior to the interview, and 0 otherwise. (c) The occupation model is estimated using a probit model. The dependent variable takes a value of 1 (0) if the agent reports a white (blue) collar type of occupation. The Blue Collar/White Collar distinction was made according to the following definition. The following are classified as White Collar Workers: Professional Foreman and Kindred, Managers, Officials and Proprietors, Individual Farmers and Farm Managers, Sales Workers, Clerical and Unskilled Workers. The following have been classified as Blue Collar Workers: Craftsmen, Foremen, and Kindred; Armed Forces, Operatives, except Transport and Transport Equipment Operatives, Laborers, except Farm, Farm Laborers and Foremen, Service Workers except Households, and Private Household. (d) The model also includes a set of cohort dummies, local labor market conditions (unemployment rate), and the variables controlling for the characteristics of the region of residence.

Table S7. Estimates of the Model of Cognitive vs. Noncognitive Skills  
Employment and Occupational Choices  
Sample from the NLSY79 - Females at age 30<sup>(a)</sup>

Variables <sup>(d)</sup>	Employment <sup>(b)</sup>	Occupation <sup>(c)</sup>
Black (Dummy)	-0.315 (0.108)	-0.497 (0.116)
Hispanic (Dummy)	-0.106 (0.142)	-0.337 (0.150)
Constant	0.690 (0.176)	0.201 (0.186)
Cognitive Factor (Loading)	0.390 (0.098)	0.959 (0.116)
Noncognitive Factor (Loading)	2.003 (0.156)	0.895 (0.136)
Precision	1.000 (0.000)	1.000 (0.000)

Notes: (a) We exclude the oversample of blacks, Hispanics, poor whites, the military sample, and those currently enrolled in college. (b) The employment decision is estimated using a probit model. The dependent variable takes a value of 1 if the individual reports that he worked during the week prior to the interview, and 0 otherwise. (c) The occupation model is estimated using a probit model. The dependent variable takes a value of 1 (0) if the agent reports a white (blue) collar type of occupation. The Blue Collar/White Collar distinction was made according to the following definition. The following are classified as White Collar Workers: Professional Foreman and Kindred, Managers, Officials and Proprietors, Individual Farmers and Farm Managers, Sales Workers, Clerical and Unskilled Workers. The following have been classified as Blue Collar Workers: Craftsmen, Foremen, and Kindred; Armed Forces, Operatives, except Transport and Transport Equipment Operatives, Laborers, except Farm, Farm Laborers and Foremen, Service Workers except Households, and Private Household. (d) The model also includes a set of cohort dummies, local labor market conditions (unemployment rate), and the variables controlling for the characteristics of the region of residence.

Table S8. Estimates of the Model of Cognitive vs. Noncognitive Skills  
 Educational Choice Model  
 Sample from the NLSY79--Males at age 30<sup>(a),(c)</sup>

Variables <sup>(b)</sup>	Schooling Level					
	HS Dropouts	GED	HS Graduates	Some College, No Degree	2-Year College Degree	4-Year College Degree
Black (Dummy)	0.636 (0.547)	0.573 (0.532)	0.585 (0.490)	0.582 (0.485)	0.428 (0.499)	
Hispanic (Dummy)	-0.010 (0.733)	0.102 (0.720)	0.258 (0.662)	0.906 (0.658)	0.592 (0.679)	
Living in a Urban area (Dummy)	0.492 (0.329)	0.614 (0.324)	0.221 (0.280)	0.350 (0.284)	0.164 (0.288)	
Living in the South (Dummy)	0.278 (0.322)	0.303 (0.306)	-0.195 (0.276)	0.195 (0.277)	0.095 (0.288)	
Broken home (Dummy)	1.410 (0.360)	1.098 (0.360)	0.709 (0.322)	0.924 (0.326)	0.741 (0.338)	
Number of Siblings	0.164 (0.066)	0.163 (0.065)	0.125 (0.060)	0.067 (0.061)	0.106 (0.062)	
Mother's Highest Grade Completed	-0.456 (0.080)	-0.436 (0.078)	-0.335 (0.071)	-0.277 (0.071)	-0.282 (0.073)	
Father's Highest Grade Completed	-0.463 (0.057)	-0.405 (0.056)	-0.397 (0.050)	-0.304 (0.050)	-0.299 (0.052)	
Family income in 1979	-0.056 (0.013)	-0.027 (0.012)	-0.028 (0.010)	-0.031 (0.010)	-0.022 (0.010)	
Local Wage	-0.023 (0.042)		-0.056 (0.032)	0.012 (0.029)		-0.037 (0.035)
Local Unemployment Rate	0.242 (2.290)		-0.157 (2.266)	0.550 (3.233)		11.129 (7.505)
GED Cost		0.788 (0.632)				
Tuition of 2yr Coll.					-0.002 (0.536)	
Tuition of 4yr Coll.						-0.015 (0.150)
Constant	11.371 (1.560)	9.168 (1.468)	11.692 (1.415)	8.225 (1.402)	7.727 (1.397)	
Cognitive Factor (Loading)	-7.150 (0.568)	-5.315 (0.516)	-4.805 (0.469)	-4.004 (0.453)	-3.801 (0.478)	
Noncognitive Factor (Loading)	-11.076 (0.940)	-12.003 (0.961)	-10.027 (0.902)	-10.287 (0.900)	-9.677 (0.985)	
Precision	1.000 (0.000)	1.000 (0.000)	1.000 (0.000)	1.000 (0.000)	1.000 (0.000)	1.000 (0.000)

Notes: (a) We exclude the oversample of blacks, Hispanics, poor whites, the military sample, and those currently enrolled in college. (b) Number of siblings, father's and mother's education refer to the level when the individual is 17 years old. Living in an urban area, living in the south, and broken home all refer to the value when the individual is 14 years of age. (c) The model also includes a set of cohort dummies.

Table S9. Estimates of the Model of Cognitive vs. Noncognitive Skills  
 Educational Choice Model  
 Sample from the NLSY79--Females at age 30<sup>(a),(c)</sup>

Variables <sup>(b)</sup>	Schooling Level					
	HS Dropouts	GED	HS Graduates	Some College, No Degree	2-Year College Degree	4-Year College Degree
Black (Dummy)	0.109 (0.288)	0.056 (0.262)	0.123 (0.224)	0.702 (0.212)	0.542 (0.225)	
Hispanic (Dummy)	-1.212 (0.363)	-1.267 (0.355)	-1.090 (0.282)	-0.048 (0.271)	-0.127 (0.284)	
Living in a Urban area (Dummy)	0.164 (0.206)	0.109 (0.187)	-0.009 (0.142)	-0.096 (0.141)	-0.202 (0.148)	
Living in the South (Dummy)	-0.306 (0.204)	-0.341 (0.176)	-0.515 (0.148)	-0.137 (0.144)	-0.189 (0.149)	
Broken home (Dummy)	0.908 (0.201)	0.648 (0.183)	0.184 (0.154)	0.393 (0.149)	0.061 (0.166)	
Number of Siblings	0.109 (0.040)	0.054 (0.037)	0.061 (0.030)	0.030 (0.030)	0.029 (0.033)	
Mother's Highest Grade Completed	-0.407 (0.042)	-0.311 (0.039)	-0.268 (0.031)	-0.110 (0.030)	-0.120 (0.033)	
Father's Highest Grade Completed	-0.223 (0.033)	-0.174 (0.030)	-0.203 (0.023)	-0.121 (0.023)	-0.112 (0.024)	
Family income in 1979	-0.037 (0.009)	-0.040 (0.008)	-0.016 (0.005)	-0.019 (0.005)	-0.017 (0.005)	
Local Wage	-0.089 (0.047)		-0.026 (0.030)	0.043 (0.030)		-0.023 (0.023)
Local Unemployment Rate	-1.685 (2.271)		-5.322 (2.088)	0.129 (2.883)		0.170 (4.071)
GED Cost		0.581 (0.361)				
Tuition of 2yr Coll.					0.103 (0.284)	
Tuition of 4yr Coll.						0.113 (0.071)
Constant	7.670 (0.922)	5.223 (0.767)	7.544 (0.701)	2.566 (0.706)	2.881 (0.683)	
Cognitive Factor (Loading)	-4.537 (0.451)	-3.047 (0.329)	-2.889 (0.272)	-1.812 (0.215)	-1.415 (0.214)	
Noncognitive Factor (Loading)	-3.028 (0.460)	-2.505 (0.427)	-1.063 (0.316)	-0.538 (0.330)	-0.375 (0.352)	
Precision	1.000 (0.000)	1.000 (0.000)	1.000 (0.000)	1.000 (0.000)	1.000 (0.000)	1.000 (0.000)

Notes: (a) We exclude the oversample of blacks, Hispanics, poor whites, the military sample, and those currently enrolled in college. (b) Number of siblings, father's and mother's education refer to the level when the individual is 17 years old. Living in an urban area, living in the south, and broken home all refer to the value when the individual is 14 years of age. (c) The model also includes a set of cohort dummies.

Table S10. Estimates of the Model of Cognitive vs. Noncognitive Skills  
 Work Experience <sup>(c)</sup>  
 Sample from the NLSY79 - Males at age 30<sup>(a)</sup>

Variables <sup>(b)</sup>	Schooling Level					
	HS Dropout	GED	HS Graduate	Some College, No Degree	2-Year College Degree	4-Year College Degree
Black (Dummy)	-1.358 (0.365)	-1.690 (0.540)	-1.612 (0.268)	-1.141 (0.422)	-3.428 (0.790)	-0.693 (0.425)
Hispanic (Dummy)	0.128 (0.443)	-0.005 (0.766)	-0.822 (0.348)	-1.258 (0.495)	-0.645 (0.968)	-0.384 (0.593)
Living in a Urban area (Dummy)	-0.421 (0.289)	-0.446 (0.513)	-0.394 (0.156)	-0.110 (0.298)	0.053 (0.468)	0.125 (0.252)
Living in the South (Dummy)	0.521 (0.272)	0.940 (0.446)	0.010 (0.167)	-0.184 (0.269)	-0.458 (0.414)	-0.637 (0.223)
Broken Home (Dummy)	-0.127 (0.260)	-0.365 (0.444)	-0.493 (0.186)	-0.459 (0.296)	-1.049 (0.512)	-0.377 (0.300)
Number of Siblings	-0.004 (0.050)	0.120 (0.091)	-0.018 (0.032)	0.014 (0.063)	-0.007 (0.096)	0.087 (0.055)
Mother's Highest Grade Completed	0.104 (0.061)	0.043 (0.097)	0.126 (0.037)	0.058 (0.066)	0.184 (0.115)	-0.046 (0.052)
Father's Highest Grade Completed	0.013 (0.051)	0.347 (0.081)	0.133 (0.028)	0.155 (0.046)	0.188 (0.077)	-0.093 (0.041)
Family Income in 1979	0.062 (0.017)	0.023 (0.022)	0.019 (0.007)	0.021 (0.011)	0.027 (0.018)	-0.003 (0.007)
Constant	8.494 (0.818)	5.525 (1.827)	7.575 (0.550)	7.041 (0.998)	5.177 (1.630)	10.522 (1.056)
Cognitive Factor (Loading)	1.520 (0.430)	2.377 (0.562)	2.049 (0.224)	1.795 (0.361)	2.941 (0.561)	0.282 (0.412)
Noncognitive Factor (Loading)	7.826 (0.495)	4.783 (0.709)	8.096 (0.422)	8.437 (0.620)	8.544 (0.969)	0.359 (0.950)
Precision	2.503 (1.333)	0.281 (0.083)	5.422 (1.862)	2.797 (1.472)	2.497 (1.457)	0.220 (0.015)

Notes: (a) We exclude the oversample of blacks, Hispanics, poor whites, the military sample, and those currently enrolled in college. (b) Number of siblings, father's and mother's education refer to the level when the individual is 17 years of age. Living in a urban area, living in the south, and broken home all refer to the value when the individual is 14 years of age; (c) Experience is measured as total years of work experience by age 30.

Table S11. Estimates of the Model of Cognitive vs. Noncognitive Skills  
 Work Experience <sup>(c)</sup>  
 Sample from the NLSY79 - Females at age 30<sup>(a)</sup>

Variables <sup>(b)</sup>	Schooling Level					
	HS Dropout	GED	HS Graduate	Some College, No Degree	2-Year College Degree	4-Year College Degree
Black (Dummy)	-1.620 (0.548)	-2.602 (0.666)	-1.477 (0.308)	-1.680 (0.366)	-1.245 (0.489)	-0.071 (0.409)
Hispanic (Dummy)	1.085 (0.659)	-1.298 (0.957)	-0.007 (0.356)	-0.657 (0.530)	0.171 (0.648)	-0.460 (0.489)
Living in a Urban area (Dummy)	-0.356 (0.454)	0.608 (0.576)	-0.029 (0.179)	0.620 (0.311)	0.458 (0.363)	0.005 (0.220)
Living in the South (Dummy)	0.087 (0.399)	0.845 (0.469)	0.047 (0.188)	-0.106 (0.276)	-0.127 (0.340)	0.062 (0.199)
Broken Home (Dummy)	-1.030 (0.391)	-0.999 (0.485)	-0.462 (0.192)	-0.370 (0.288)	-0.035 (0.406)	-0.533 (0.273)
Number of Siblings	-0.165 (0.076)	-0.126 (0.089)	-0.082 (0.038)	-0.045 (0.064)	-0.076 (0.091)	-0.045 (0.051)
Mother's Highest Grade Completed	0.378 (0.085)	0.147 (0.104)	0.116 (0.043)	0.041 (0.065)	0.155 (0.089)	0.013 (0.043)
Father's Highest Grade Completed	0.068 (0.075)	0.047 (0.082)	0.074 (0.034)	-0.011 (0.054)	-0.053 (0.065)	-0.059 (0.032)
Family Income in 1979	0.060 (0.023)	0.018 (0.029)	0.026 (0.008)	0.019 (0.013)	0.024 (0.016)	0.001 (0.007)
Constant	5.369 (1.463)	4.215 (1.644)	6.213 (0.592)	6.702 (0.956)	5.114 (1.253)	8.292 (0.852)
Cognitive Factor (Loading)	3.391 (0.713)	1.776 (0.751)	2.457 (0.306)	1.106 (0.420)	1.234 (0.483)	0.617 (0.306)
Noncognitive Factor (Loading)	8.448 (1.091)	5.079 (1.108)	8.806 (0.504)	7.875 (0.710)	7.731 (0.674)	5.502 (0.678)
Precision	1.308 (1.156)	0.195 (0.085)	3.748 (1.552)	1.267 (0.871)	2.250 (1.328)	0.671 (0.278)

Notes: (a) We exclude the oversample of blacks, Hispanics, poor whites, the military sample, and those currently enrolled in college. (b) Number of siblings, father's and mother's education refer to the level when the individual is 17 years of age. Living in a urban area, living in the south, and broken home all refer to the value when the individual is 14 years of age; (c) Experience is measured as total years of work experience by age 30.

Table S12. Estimates of the Model of Cognitive vs. Noncognitive Skills  
Behavioral Outcomes  
Sample from the NLSY79 - Males at age 30<sup>(a)</sup>

Variables <sup>(b),(c)</sup>	Smoking <sup>(d)</sup>	Marijuana <sup>(e)</sup>	Jail <sup>(f)</sup>	Illegal Index <sup>(g)</sup>
Black (Dummy)	-0.211 (0.099)	-0.281 (0.096)	1.037 (0.170)	0.103 (0.095)
Hispanic (Dummy)	-0.493 (0.127)	-0.161 (0.120)	-0.388 (0.293)	-0.009 (0.123)
Living in a Urban area (Dummy)	0.152 (0.070)	0.305 (0.068)	0.164 (0.167)	0.100 (0.066)
Living in the South (Dummy)	0.086 (0.067)	-0.195 (0.063)	0.260 (0.142)	-0.191 (0.064)
Broken Home (Dummy)	0.285 (0.073)	0.293 (0.071)	0.348 (0.150)	0.116 (0.070)
Number of Siblings	0.013 (0.014)	0.022 (0.014)	0.002 (0.029)	0.021 (0.013)
Mother's Highest Grade Completed	-0.040 (0.015)	0.004 (0.015)	-0.059 (0.033)	-0.013 (0.014)
Father's Highest Grade Completed	-0.010 (0.011)	0.021 (0.011)	-0.022 (0.026)	0.032 (0.011)
Family Income in 1979	-0.002 (0.003)	0.005 (0.003)	-0.005 (0.009)	0.004 (0.003)
Constant	0.299 (0.208)	-0.450 (0.199)	-2.506 (0.552)	-0.741 (0.195)
Cognitive Factor (Loading)	-0.496 (0.072)	-0.165 (0.066)	-0.829 (0.171)	-0.142 (0.065)
Noncognitive Factor (Loading)	-0.747 (0.096)	-0.509 (0.090)	-1.885 (0.189)	-0.461 (0.087)
Precision	1.000 (0.000)	1.000 (0.000)	1.000 (0.000)	1.000 (0.000)

Notes: (a) We exclude the oversample of blacks, Hispanics, poor whites, the military sample, and those currently enrolled in college. (b) Number of siblings, father's and mother's education refer to the level when the individual is 17 years of age. Living in a urban area, living in the south, and broken home all refer to the value when the individual is 14 years of age. (c) The model also includes a set of cohort dummies. (d) Smoking indicates whether an individual smokes daily by age 18. (e) Marijuana indicates whether an individual smoked marijuana in 1979 or 1980. (f) Jail indicates ever having lived in jail by age 30. (g) This index indicates whether an individual participated in any of the following illegal activities in 1979 or 1980: attempting to "con" someone, taking a vehicle without the owner's permission, shoplifting, intentionally damaging another person's property, or using force to obtain things.

Table S13. Estimates of the Model of Cognitive vs. Noncognitive Skills  
Behavioral Outcomes

Sample from the NLSY79 - Females at age 30<sup>(a)</sup>

Variables <sup>(b),(c)</sup>	Smoking <sup>(d)</sup>	Marijuana <sup>(e)</sup>	Illegal Index <sup>(g)</sup>
Black (Dummy)	-0.422 (0.093)	-0.381 (0.088)	-0.014 (0.088)
Hispanic (Dummy)	-0.652 (0.123)	-0.240 (0.115)	-0.124 (0.114)
Living in a Urban area (Dummy)	0.131 (0.068)	0.084 (0.064)	-0.004 (0.064)
Living in the South (Dummy)	-0.143 (0.061)	-0.285 (0.057)	-0.114 (0.059)
Broken Home (Dummy)	0.178 (0.066)	0.199 (0.065)	0.119 (0.065)
Number of Siblings	0.033 (0.013)	0.011 (0.013)	0.009 (0.013)
Mother's Highest Grade Completed	0.001 (0.013)	0.011 (0.013)	-0.017 (0.013)
Father's Highest Grade Completed	-0.020 (0.011)	0.009 (0.010)	0.016 (0.010)
Family Income in 1979	-0.005 (0.003)	0.001 (0.002)	0.002 (0.002)
Constant	-0.011 (0.191)	-0.320 (0.181)	-0.709 (0.187)
Cognitive Factor (Loading)	-0.673 (0.087)	-0.230 (0.071)	-0.124 (0.072)
Noncognitive Factor (Loading)	-0.257 (0.082)	0.124 (0.077)	0.092 (0.077)
Precision	1.000 (0.000)	1.000 (0.000)	1.000 (0.000)

Notes: (a) We exclude the oversample of blacks, Hispanics, poor whites, the military sample, and those currently enrolled in college. (b) Number of siblings, father's and mother's education refer to the level when the individual is 17 years of age. Living in a urban area, living in the south, and broken home all refer to the value when the individual is 14 years of age. (c) The model also includes a set of cohort dummies. (d) Smoking indicates whether an individual smokes daily by age 18. (e) Marijuana indicates whether an individual smoked marijuana in 1979 or 1980. (f) Jail indicates ever having lived in jail by age 30. (g) This index indicates whether an individual participated in any of the following illegal activities in 1979 or 1980: attempting to "con" someone, taking a vehicle without the owner's permission, shoplifting, intentionally damaging another person's property, or using force to obtain things.



Table S14. Estimates of the Model of Cognitive vs. Noncognitive Skills  
Behavioral Outcomes  
Sample from the NLSY79--Females at age 30<sup>(a)</sup>

Variables <sup>(b)</sup>	Single/No Child <sup>(c)</sup>		
	Married/Child	Married/No Child	Single/Child
Black (Dummy)	-0.935 (0.224)	-1.226 (0.271)	1.119 (0.171)
Hispanic (Dummy)	-0.435 (0.239)	-0.618 (0.260)	0.124 (0.254)
Living in a Urban area at age 14 (Dummy)	-0.139 (0.134)	-0.017 (0.137)	0.282 (0.174)
Living in the South at age 14 (Dummy)	0.297 (0.130)	0.620 (0.125)	-0.064 (0.148)
Broken Home at age 14 (Dummy)	0.163 (0.133)	0.232 (0.137)	0.534 (0.142)
Number of Siblings at age 14	-0.009 (0.027)	-0.032 (0.029)	0.040 (0.028)
Mother Highest Grade Completed	-0.125 (0.027)	-0.073 (0.028)	-0.124 (0.031)
Father Highest Grade Completed	-0.032 (0.022)	-0.066 (0.023)	-0.003 (0.027)
Family income in 1979	-0.037 (0.007)	-0.012 (0.007)	-0.018 (0.008)
Constant	0.478 (0.404)	-0.449 (0.428)	-1.519 (0.472)
Cognitive Factor (Loading)	-0.787 (0.180)	-0.417 (0.167)	-1.172 (0.209)
Noncognitive Factor (Loading)	-1.729 (0.198)	-1.331 (0.183)	-1.388 (0.198)
Precision	1.000 (0.000)	1.000 (0.000)	1.000 (0.000)

Notes: (a) We exclude the oversample of blacks, Hispanics, poor whites, the military sample, and those currently enrolled in college. (b) Number of siblings, father's and mother's education refer to the level when the individual is 17 years of age. Living in a urban area, living in the south, and broken home all refer to the value when the individual is 14 years of age; (c) Marital and fertility choice is by age 18.

Table S15. Estimates of the Model of Cognitive vs. Noncognitive Skills

Auxiliary Equations - Cognitive Variables <sup>(a)</sup>Sample from the NLSY79--Males at age 30<sup>(\*)</sup>

Variables <sup>(b)</sup>	Highest Grade Attained at Test Date (9-11)					Highest Grade Attained at Test Date (12)				
	Arithmetic	World	Paragraph	Math	Coding	Arithmetic	World	Paragraph	Math	Coding
	Reasoning	Knowledge	Compositor	Knowledge	Speed	Reasoning	Knowledge	Compositor	Knowledge	Speed
Black (Dummy)	-0.676 (0.082)	-0.704 (0.078)	-0.599 (0.086)	-0.469 (0.078)	-0.550 (0.077)	-1.012 (0.110)	-0.967 (0.090)	-0.800 (0.098)	-0.546 (0.107)	-0.774 (0.101)
Hispanic (Dummy)	-0.176 (0.105)	-0.091 (0.099)	-0.070 (0.109)	0.037 (0.101)	-0.024 (0.100)	-0.374 (0.133)	-0.201 (0.110)	-0.010 (0.118)	-0.195 (0.130)	-0.030 (0.122)
Living in a Urban area (Dummy)	0.048 (0.057)	-0.056 (0.056)	-0.049 (0.062)	-0.026 (0.057)	0.044 (0.058)	-0.094 (0.067)	-0.063 (0.056)	-0.103 (0.059)	0.007 (0.065)	-0.084 (0.062)
Living in the South (Dummy)	-0.172 (0.054)	-0.235 (0.051)	-0.189 (0.057)	-0.124 (0.052)	-0.137 (0.051)	-0.220 (0.070)	-0.138 (0.057)	-0.139 (0.062)	-0.218 (0.066)	-0.210 (0.064)
Broken home (Dummy)	-0.095 (0.056)	-0.031 (0.054)	-0.071 (0.060)	-0.090 (0.056)	-0.040 (0.056)	-0.124 (0.074)	-0.090 (0.065)	-0.118 (0.067)	-0.178 (0.074)	0.093 (0.072)
Number of Siblings	0.001 (0.011)	-0.028 (0.011)	-0.026 (0.012)	0.001 (0.011)	-0.010 (0.011)	-0.007 (0.014)	-0.056 (0.012)	-0.043 (0.013)	-0.035 (0.014)	-0.003 (0.013)
Mother's Highest Grade Completed	0.055 (0.013)	0.070 (0.012)	0.066 (0.013)	0.063 (0.012)	0.031 (0.012)	0.036 (0.015)	0.030 (0.012)	0.028 (0.013)	0.035 (0.014)	0.026 (0.014)
Father's Highest Grade Completed	0.026 (0.010)	0.034 (0.009)	0.036 (0.011)	0.040 (0.010)	0.011 (0.009)	0.042 (0.011)	0.042 (0.009)	0.042 (0.010)	0.056 (0.011)	0.028 (0.011)
Family income in 1979	0.010 (0.003)	0.007 (0.003)	0.007 (0.003)	0.010 (0.003)	0.010 (0.003)	0.001 (0.003)	0.001 (0.002)	0.000 (0.002)	0.001 (0.003)	0.004 (0.003)
Constant	-0.433 (0.207)	-0.629 (0.196)	-0.591 (0.218)	-0.923 (0.201)	-0.641 (0.198)	0.032 (0.207)	0.164 (0.172)	0.015 (0.1827)	-0.695 (0.2020)	-0.324 (0.194)
Cognitive Factor (Loading)	1.480 (0.074)	1.222 (0.065)	1.427 (0.073)	1.417 (0.071)	1.000 (0.000)	1.715 (0.102)	1.200 (0.080)	1.327 (0.087)	1.603 (0.097)	1.036 (0.083)
Noncognitive Factor (Loading)										
Precision	4.767 (0.318)	3.632 (0.206)	3.292 (0.201)	4.755 (0.320)	2.610 (0.128)	4.495 (0.352)	4.071 (0.256)	3.820 (0.254)	4.191 (0.304)	2.303 (0.120)

Notes: (a) We standardize the test scores to have within-sample mean 0, variance 1; (b) Number of siblings, local unemployment rate, local wage, father's and mother's education refer to the level when the individual is 17 years of age. Living in a urban area, living in the south, and broken home all refer to the value when the individual is 14 years of age. The model also includes a set of cohort dummies. (\*) : We exclude the oversample of blacks, Hispanics, poor whites, the military sample, and those currently enrolled in college.

Table S16. Estimates of the Model of Cognitive vs. Noncognitive Skills

Auxiliary Equations - Cognitive Variables <sup>(a)</sup>Sample from the NLSY79--Males at age 30<sup>(\*)</sup>

Variables <sup>(b)</sup>	Highest Grade Attained at Test Date (Some College)					Highest Grade Attained at Test Date (4+ Years of College)				
	Arithmetic Reasoning	World Knowledge	Paragraph Composition	Math Knowledge	Coding Speed	Arithmetic Reasoning	World Knowledge	Paragraph Composition	Math Knowledge	Coding Speed
Black (Dummy)	-1.104 (0.156)	-0.599 (0.101)	-0.427 (0.106)	-0.923 (0.166)	-0.748 (0.151)	-0.362 (0.332)	-0.665 (0.215)	-0.306 (0.227)	-0.571 (0.363)	-0.263 (0.386)
Hispanic (Dummy)	-0.611 (0.184)	-0.404 (0.123)	-0.284 (0.132)	-0.408 (0.199)	-0.019 (0.187)	0.028 (0.355)	0.224 (0.217)	-0.130 (0.236)	0.269 (0.384)	-0.030 (0.391)
Living in a Urban area at age 14 (Dummy)	-0.208 (0.096)	-0.075 (0.069)	-0.127 (0.073)	-0.204 (0.106)	-0.018 (0.106)	0.161 (0.205)	-0.035 (0.129)	0.014 (0.139)	0.088 (0.222)	0.199 (0.237)
Living in the South at age 14 (Dummy)	-0.012 (0.088)	0.020 (0.060)	0.068 (0.064)	0.046 (0.097)	0.036 (0.092)	-0.295 (0.218)	-0.236 (0.134)	-0.165 (0.146)	-0.524 (0.236)	-0.136 (0.247)
Broken home at Age 14 (Dummy)	0.092 (0.112)	0.005 (0.077)	-0.112 (0.082)	-0.068 (0.122)	-0.026 (0.117)	0.157 (0.242)	-0.084 (0.151)	-0.088 (0.162)	-0.119 (0.262)	0.055 (0.271)
Number of Siblings at age 17	-0.029 (0.018)	-0.036 (0.013)	-0.034 (0.014)	-0.024 (0.020)	-0.050 (0.020)	0.027 (0.064)	-0.035 (0.042)	-0.006 (0.045)	-0.029 (0.071)	-0.042 (0.075)
Mother's Highest Grade Completed	0.051 (0.020)	0.005 (0.014)	0.014 (0.015)	0.032 (0.022)	0.045 (0.021)	0.038 (0.040)	0.015 (0.026)	-0.024 (0.027)	0.035 (0.044)	-0.005 (0.047)
Father's Highest Grade Completed	0.026 (0.013)	0.028 (0.009)	0.003 (0.010)	0.037 (0.014)	-0.015 (0.014)	0.028 (0.028)	0.000 (0.018)	0.018 (0.019)	0.014 (0.031)	0.036 (0.033)
Family income in 1979	0.002 (0.003)	0.002 (0.002)	0.004 (0.002)	0.007 (0.003)	0.004 (0.003)	0.001 (0.005)	-0.002 (0.003)	0.000 (0.003)	-0.001 (0.005)	-0.001 (0.005)
Constant	0.042 (0.261)	0.463 (0.175)	0.531 (0.191)	-0.186 (0.283)	0.140 (0.271)	0.016 (0.528)	1.084 (0.337)	0.979 (0.357)	0.545 (0.577)	0.375 (0.613)
Cognitive Factor (Loading)	1.735 (0.116)	0.731 (0.076)	0.761 (0.081)	1.826 (0.126)	0.757 (0.111)	1.2219 (0.232)	0.4174 (0.161)	0.2869 (0.176)	1.3949 (0.252)	0.8540 (0.300)
Noncognitive Factor (Loading)										
Precision	8.879 (1.277)	6.084 (0.496)	5.241 (0.429)	6.282 (0.815)	2.146 (0.162)	7.121 (1.845)	9.269 (1.874)	7.191 (1.417)	7.046 (1.892)	2.967 (0.632)

Notes: (a) We standardize the test scores to have within-sample mean 0, variance 1; (b) Number of siblings, local unemployment rate, local wage, father's and mother's education refer to the level when the individual is 17 years of age. Living in a urban area, living in the south, and broken home all refer to the value when the individual is 14 years of age. The model also includes a set of cohort dummies. (\*) : We exclude the oversample of blacks, Hispanics, poor whites, the military sample, and those currently enrolled in college.

Table S17. Estimates of the Model of Cognitive vs. Noncognitive Skills  
 Auxiliary Equations - Noncognitive Variables <sup>(a)</sup>  
 Sample from the NLSY79--Males at age 30 <sup>(c)</sup>

Variables <sup>(b)</sup>	Highest Grade Attained at Test Date (9-11)		Highest Grade Attained at Test Date (12)		Highest Grade Attained at Test Date (13+ Years of School)	
	Rotter Locus of Control	Rosenberg Self-Esteem Scale	Rotter Locus of Control	Rosenberg Self-Esteem Scale	Rotter Locus of Control	Rosenberg Self-Esteem Scale
Black (Dummy)	0.090 (0.084)	0.162 (0.094)	-0.002 (0.136)	0.047 (0.115)	-0.326 (0.249)	0.416 (0.204)
Hispanic (Dummy)	-0.006 (0.108)	0.083 (0.120)	0.175 (0.172)	0.279 (0.147)	-0.516 (0.303)	-0.470 (0.240)
Living in a Urban area (Dummy)	-0.064 (0.062)	-0.017 (0.072)	0.103 (0.089)	0.043 (0.074)	0.279 (0.174)	0.184 (0.134)
Living in the South (Dummy)	-0.090 (0.058)	-0.106 (0.066)	-0.018 (0.090)	-0.066 (0.075)	-0.156 (0.146)	-0.074 (0.119)
Broken home (Dummy)	-0.133 (0.062)	0.091 (0.071)	0.061 (0.103)	0.123 (0.085)	-0.356 (0.179)	-0.096 (0.145)
Number of Siblings	-0.004 (0.012)	-0.017 (0.014)	-0.022 (0.018)	-0.032 (0.017)	0.031 (0.032)	-0.012 (0.025)
Mother's Highest Grade Completed	0.026 (0.013)	0.030 (0.015)	0.011 (0.020)	-0.004 (0.017)	0.034 (0.033)	0.019 (0.026)
Father's Highest Grade Completed	0.010 (0.010)	0.027 (0.012)	0.029 (0.015)	0.021 (0.013)	0.006 (0.021)	-0.001 (0.017)
Family income in 1979	0.008 (0.003)	0.002 (0.003)	0.000 (0.003)	0.003 (0.003)	-0.002 (0.004)	0.005 (0.003)
Constant	-0.460 (0.225)	-0.698 (0.243)	-0.282 (0.262)	0.039 (0.229)	-0.084 (0.420)	0.365 (0.337)
Cognitive Factor (Loading)						
Noncognitive Factor (Loading)	0.182 (0.072)	1.000 (0.000)	0.351 (0.129)	0.276 (0.105)	0.218 (0.220)	0.188 (0.190)
Precision	1.139 (0.044)	1.223 (0.058)	1.038 (0.055)	1.109 (0.053)	1.207 (0.117)	1.291 (0.104)

Notes: (a) The locus of control scale is based on the four-item abbreviated version of the Rotter Internal-External Locus of Control Scale. This scale is designed to measure the extent to which individuals believe they have control over their lives through self-motivation or self-determination (internal control) as opposed to the extent that the environment controls their lives (external control). The Self-Esteem Scale is based on the 10-item Rosenberg Self-Esteem scale. This scale describes a degree of approval or disapproval toward oneself. In both cases, we standardize the test scores to have within-sample mean 0 and variance 1, after taking averages over the respective sets of scales; (b) Number of siblings, local unemployment rate, local wage, father's and mother's education refer to the level when the individual is 17 years of age. Living in a urban area, living in the south, and broken home all refer to the value when the individual is 14 years of age. The model also includes a set of cohort dummies. (\*) : We exclude the oversample of blacks, Hispanics, poor whites, the military sample, and those currently enrolled in college.

Table S18. Estimates of the Model of Cognitive vs. Noncognitive Skills

Auxiliary Equations - Cognitive Variables <sup>(a)</sup>Sample from the NLSY79--Females at age 30 <sup>(\*)</sup>

Variables <sup>(b)</sup>	Highest Grade Attained at Test Date (9-11)					Highest Grade Attained at Test Date (12)				
	Arithmetic Reasoning	World Knowledge	Paragraph Composition	Math Knowledge	Coding Speed	Arithmetic Reasoning	World Knowledge	Paragraph Composition	Math Knowledge	Coding Speed
Black (Dummy)	-0.463 (0.075)	-0.738 (0.076)	-0.625 (0.080)	-0.380 (0.079)	-0.661 (0.085)	-0.801 (0.087)	-0.740 (0.072)	-0.744 (0.074)	-0.503 (0.084)	-0.694 (0.090)
Hispanic (Dummy)	-0.178 (0.090)	-0.219 (0.089)	-0.175 (0.097)	0.069 (0.093)	0.037 (0.103)	-0.211 (0.114)	-0.206 (0.095)	-0.322 (0.099)	-0.167 (0.110)	-0.101 (0.119)
Living in a Urban area (Dummy)	-0.060 (0.058)	-0.149 (0.057)	-0.074 (0.062)	-0.055 (0.059)	-0.096 (0.065)	-0.075 (0.059)	-0.106 (0.050)	-0.069 (0.052)	-0.037 (0.059)	-0.103 (0.062)
Living in the South (Dummy)	-0.031 (0.052)	-0.102 (0.051)	-0.045 (0.055)	-0.033 (0.053)	-0.170 (0.058)	-0.078 (0.057)	-0.085 (0.047)	-0.003 (0.050)	-0.065 (0.056)	-0.079 (0.059)
Broken home (Dummy)	-0.105 (0.054)	-0.027 (0.054)	-0.053 (0.058)	-0.130 (0.057)	-0.047 (0.062)	-0.128 (0.061)	-0.014 (0.051)	-0.025 (0.053)	-0.014 (0.059)	-0.111 (0.064)
Number of Siblings	-0.009 (0.011)	-0.037 (0.011)	-0.035 (0.012)	-0.001 (0.011)	-0.049 (0.012)	-0.010 (0.012)	-0.026 (0.010)	-0.027 (0.010)	-0.016 (0.012)	-0.010 (0.013)
Mother's Highest Grade Completed	0.049 (0.011)	0.051 (0.011)	0.046 (0.012)	0.067 (0.012)	0.032 (0.013)	0.051 (0.013)	0.066 (0.011)	0.045 (0.011)	0.045 (0.013)	0.023 (0.014)
Father's Highest Grade Completed	0.032 (0.009)	0.040 (0.009)	0.045 (0.010)	0.052 (0.010)	0.016 (0.010)	0.031 (0.010)	0.033 (0.009)	0.024 (0.009)	0.044 (0.010)	0.016 (0.011)
Family income in 1979	0.009 (0.003)	0.008 (0.003)	0.012 (0.003)	0.009 (0.003)	0.004 (0.003)	0.003 (0.002)	0.001 (0.002)	0.001 (0.002)	0.007 (0.002)	0.000 (0.003)
Constant	-0.666 (0.195)	-0.567 (0.192)	-0.529 (0.209)	-1.293 (0.204)	0.097 (0.218)	-0.482 (0.175)	-0.158 (0.148)	0.060 (0.1507)	-0.913 (0.1713)	0.408 (0.187)
Cognitive Factor (Loading)	1.458 (0.098)	1.347 (0.096)	1.464 (0.105)	1.535 (0.103)	1.000 (0.000)	1.753 (0.128)	1.147 (0.097)	1.119 (0.098)	1.643 (0.121)	0.896 (0.093)
Noncognitive Factor (Loading)	--	--	--	--	--	--	--	--	--	--
Precision	4.847 (0.342)	4.146 (0.280)	3.535 (0.242)	4.528 (0.348)	2.012 (0.103)	5.754 (0.452)	4.180 (0.225)	3.570 (0.187)	5.255 (0.377)	1.800 (0.085)

Notes: (a) We standardize the test scores to have within-sample mean 0, variance 1; (b) Number of siblings, local unemployment rate, local wage, father's and mother's education refer to the level when the individual is 17 years of age. Living in a urban area, living in the south, and broken home all refer to the value when the individual is 14 years of age. The model also includes a set of cohort dummies. (\*): We exclude the oversample of blacks, Hispanics, poor whites, the military sample, and those currently enrolled in college.

Table S19. Estimates of the Model of Cognitive vs. Noncognitive Skills

Auxiliary Equations - Cognitive Variables <sup>(a)</sup>Sample from the NLSY79--Females at age 30<sup>(\*)</sup>

Variables <sup>(b)</sup>	Highest Grade Attained at Test Date (Some College)					Highest Grade Attained at Test Date (4+ Years of College)				
	Arithmetic Reasoning	World Knowledge	Paragraph Composition	Math Knowledge	Coding Speed	Arithmetic Reasoning	World Knowledge	Paragraph Composition	Math Knowledge	Coding Speed
Black (Dummy)	-0.921 (0.114)	-0.904 (0.073)	-0.786 (0.073)	-0.700 (0.124)	-0.843 (0.115)	-1.590 (0.344)	-1.031 (0.191)	-0.394 (0.225)	-0.826 (0.317)	-0.579 (0.495)
Hispanic (Dummy)	-0.438 (0.191)	-0.321 (0.125)	-0.612 (0.127)	-0.347 (0.209)	-0.315 (0.197)	-0.889 (0.472)	-0.036 (0.263)	0.229 (0.317)	-0.469 (0.430)	-0.345 (0.664)
Living in a Urban area at age 14 (Dummy)	-0.071 (0.086)	-0.033 (0.056)	0.049 (0.056)	-0.029 (0.095)	-0.063 (0.088)	-0.243 (0.278)	-0.057 (0.157)	-0.138 (0.186)	0.215 (0.254)	-0.052 (0.397)
Living in the South at age 14 (Dummy)	-0.071 (0.080)	-0.018 (0.050)	0.046 (0.051)	-0.014 (0.087)	0.153 (0.080)	0.020 (0.177)	0.009 (0.099)	-0.039 (0.120)	0.039 (0.163)	0.334 (0.248)
Broken home at Age 14 (Dummy)	-0.007 (0.096)	-0.076 (0.063)	-0.004 (0.064)	-0.017 (0.103)	-0.024 (0.100)	0.054 (0.236)	0.009 (0.136)	0.246 (0.159)	0.063 (0.212)	0.122 (0.338)
Number of Siblings at age 17	-0.014 (0.019)	-0.012 (0.012)	-0.023 (0.012)	-0.030 (0.020)	-0.011 (0.019)	-0.041 (0.036)	-0.012 (0.020)	0.002 (0.024)	0.019 (0.033)	-0.057 (0.052)
Mother's Highest Grade Completed	0.066 (0.017)	0.042 (0.011)	0.032 (0.011)	0.043 (0.019)	-0.027 (0.017)	0.013 (0.044)	-0.016 (0.025)	0.003 (0.030)	0.006 (0.040)	0.028 (0.062)
Father's Highest Grade Completed	0.038 (0.013)	0.037 (0.008)	0.024 (0.008)	0.044 (0.014)	0.019 (0.013)	0.028 (0.034)	0.036 (0.019)	0.046 (0.023)	0.044 (0.031)	-0.036 (0.050)
Family income in 1979	0.005 (0.003)	0.004 (0.002)	0.004 (0.002)	0.007 (0.003)	0.005 (0.003)	0.013 (0.005)	0.004 (0.003)	0.004 (0.003)	0.013 (0.005)	0.012 (0.007)
Constant	-0.650 (0.265)	-0.097 (0.167)	0.169 (0.169)	-0.582 (0.287)	0.871 (0.261)	0.4688 (0.569)	0.8432 (0.325)	0.1169 (0.382)	-0.4132 (0.510)	0.9654 (0.839)
Cognitive Factor (Loading)	1.757 (0.143)	0.739 (0.078)	0.757 (0.080)	1.985 (0.157)	0.670 (0.108)	1.3055 (0.251)	0.3584 (0.152)	0.6036 (0.174)	1.2288 (0.227)	-0.0619 (0.405)
Noncognitive Factor (Loading)	--	--	--	--	--	--	--	--	--	--
Precision	5.856 (0.615)	6.220 (0.434)	6.161 (0.443)	6.373 (0.855)	1.934 (0.130)	6.122 (1.578)	10.081 (1.949)	8.535 (1.733)	7.894 (2.000)	1.391 (0.262)

Notes: (a) We standardize the test scores to have within-sample mean 0, variance 1; (b) Number of siblings, local unemployment rate, local wage, father's and mother's education refer to the level when the individual is 17 years of age. Living in a urban area, living in the south, and broken home all refer to the value when the individual is 14 years of age. The model also includes a set of cohort dummies. (\*) : We exclude the oversample of blacks, Hispanics, poor whites, the military sample, and those currently enrolled in college.

Table S20. Estimates of the Model of Cognitive vs. Noncognitive Skills  
 Auxiliary Equations - Non-cognitive Variables <sup>(a)</sup>  
 Sample from the NLSY79--Females at age 30 <sup>(\*)</sup>

Variables <sup>(b)</sup>	Highest Grade Attained at Test Date (9-11)		Highest Grade Attained at Test Date (12)		Highest Grade Attained at Test Date (13+ Years of School)	
	Rotter Locus of Control	Rosenberg Self-Esteem Scale	Rotter Locus of Control	Rosenberg Self-Esteem Scale	Rotter Locus of Control	Rosenberg Self-Esteem Scale
Black (Dummy)	-0.051 (0.083)	0.148 (0.104)	-0.070 (0.116)	0.151 (0.099)	-0.745 (0.176)	-0.123 (0.152)
Hispanic (Dummy)	0.037 (0.103)	0.021 (0.126)	0.271 (0.165)	0.232 (0.142)	0.358 (0.324)	-0.306 (0.258)
Living in a Urban area (Dummy)	0.014 (0.065)	0.111 (0.080)	0.007 (0.082)	0.045 (0.072)	0.228 (0.150)	0.248 (0.118)
Living in the South (Dummy)	0.014 (0.057)	-0.041 (0.072)	0.009 (0.076)	-0.048 (0.065)	0.185 (0.124)	-0.117 (0.103)
Broken home (Dummy)	0.024 (0.062)	0.008 (0.076)	-0.062 (0.088)	0.070 (0.075)	0.059 (0.156)	0.000 (0.132)
Number of Siblings	-0.037 (0.012)	-0.036 (0.015)	-0.008 (0.017)	-0.036 (0.014)	0.046 (0.028)	0.026 (0.024)
Mother's Highest Grade Completed	0.021 (0.013)	0.003 (0.016)	0.027 (0.018)	0.019 (0.015)	0.024 (0.028)	0.005 (0.023)
Father's Highest Grade Completed	0.011 (0.010)	0.019 (0.013)	0.037 (0.014)	0.026 (0.012)	-0.012 (0.021)	0.022 (0.017)
Family income in 1979	0.007 (0.003)	0.000 (0.004)	0.001 (0.003)	0.006 (0.003)	0.005 (0.004)	0.000 (0.003)
Constant	-0.477 (0.223)	-0.283 (0.274)	-0.522 (0.224)	-0.487 (0.201)	-0.024 (0.402)	-0.014 (0.323)
Cognitive Factor (Loading)	-- --	-- --	-- --	-- --	-- --	-- --
Noncognitive Factor (Loading)	0.134 (0.076)	1.000 (0.000)	-0.004 (0.100)	0.045 (0.086)	-0.112 (0.188)	0.130 (0.161)
Precision	1.174 (0.047)	1.050 (0.052)	0.976 (0.046)	1.095 (0.048)	(1.2665) (0.109)	(1.1898) (0.084)

Notes: (a) The locus of control scale is based on the four-item abbreviated version of the Rotter Internal-External Locus of Control Scale. This scale is designed to measure the extent to which individuals believe they have control over their lives through self-motivation or self-determination (internal control) as opposed to the extent that the environment controls their lives (external control). The Self-Esteem Scale is based on the 10-item Rosenberg Self-Esteem scale. This scale describes a degree of approval or disapproval toward oneself. In both cases, we standardize the test scores to have within-sample mean 0 and variance 1, after taking averages over the respective sets of scales; (b) Number of siblings, local unemployment rate, local wage, father's and mother's education refer to the level when the individual is 17 years of age. Living in a urban area, living in the south, and broken home all refer to the value when the individual is 14 years of age. The model also includes a set of cohort dummies. (\*) : We exclude the oversample of blacks, Hispanics, poor whites, the military sample, and those currently enrolled in college.

**Table S21A**  
**Goodness of Fit Tests for Continuous Outcomes**  
**Null Hypothesis : Model = Data**  
**Age 30 Sample from NLSY79**

<b>i. Wage Distributions</b>				
Schooling Level	Men		Women	
	Chi2 Test	Kolmogorov-Smirnov Test	Chi2 Test	Kolmogorov-Smirnov Test
HS Dropout	0.853	0.826	0.393	0.704
GED	0.934	0.429	0.077	0.031
HS Graduates	0.924	0.978	0.539	0.980
Some College	0.219	0.306	0.796	0.575
2-Year College Graduate	0.180	0.433	0.210	0.545
4-Year College Graduate	0.024	0.396	0.061	0.010
Overall	0.158	0.705	0.673	0.652

<b>ii. Work Experience Distributions</b>				
Schooling Level	Men		Women	
	Chi2 Test	Kolmogorov-Smirnov Test	Chi2 Test	Kolmogorov-Smirnov Test
HS Dropout	0.456	0.399	0.000	0.000
GED	0.073	0.210	0.248	0.064
HS Graduates	0.014	0.030	0.000	0.000
Some College	0.236	0.116	0.386	0.154
2-Year College Graduate	0.829	0.232	0.000	0.000
4-Year College Graduate	0.743	0.231	0.000	0.000
Overall	0.022	0.018	0.000	0.000

Notes (a) The test is computed using equiprobable bins; (b) The tests did not compute exact p-values, but were conservative approximations such that the exact p-values are lower than the approximate p-values reported in parentheses.



Table S21B  
 Goodness of Fit Tests for Discrete Choices  
 Null Hypothesis : Model = Data  
 Age 30 Sample from NLSY79

Discrete Choice	Chi2 Test	
	Men	Women
Education	0.307	0.628
Employment	0.959	0.732
Occupation	0.999	0.980
Smoking	0.413	0.927
Marijuana	0.946	0.875
Jail	0.725	--
Illegal Index	0.796	0.791
Marriage and Fertility	--	0.162

Notes (a) The test is computed using equiprobable bins; (b) The tests did not compute exact p-values, but were conservative approximations such that the exact p-values are lower than the approximate p-values reported in parentheses.

Table S22.  $\chi^2$  Test of the Joint Significance of Abilities  
Sample from NLSY79 <sup>(a)</sup>

	Cognitive		Noncognitive	
	Males <sup>(b)</sup>	Females <sup>(c)</sup>	Males <sup>(d)</sup>	Females <sup>(e)</sup>
$\chi^2$	536.58	270.56	556.07	270.56
p-value	0.000	0.000	0.000	0.000
Critical Value at 90%	54.09	52.94	37.91	36.74
Critical Value at 95%	58.12	56.94	41.33	40.11

Notes: (a) We exclude the oversample of blacks, Hispanics, poor whites, the military sample, and those currently enrolled in college. In each case the the null hypothesis is the joint significant of the respective ability loadings in the model. We exclude the normalized loadings. (b) 42 degrees of freedom ; (c) 41 degrees of freedom; (d) 27 degrees of freedom; (e) 28 degrees of freedom.

Table S23. Kolmogorov-Smirnov tests for Normality of Factor Distributions  
Age 30 Sample from NLSY79

	Males	Females
Cognitive Factor	0.000	0.003
Noncognitive Factor	0.000	0.000

Notes. The null hypothesis is that the factor is normally distributed. The tests did not compute exact p-values, but were conservative approximations such that the exact p-values are lower than the reported approximate p-values. The factors are simulated from the estimates of the model. The simulated data contain 20,000 observations.

Table S24.  $\chi^2$  Test of the Effect of Schooling at Test Date on Cognitive and Noncognitive Test Scores  
Null Hypothesis: Factor Loadings Equivalent Across Schooling Levels  
Sample from NLSY79 <sup>(a)</sup>

	Cognitive		Noncognitive	
	Males <sup>(b)</sup>	Females <sup>(c)</sup>	Males <sup>(d)</sup>	Females <sup>(e)</sup>
$\chi^2$	431.65	597	116.53	202.74
p-value	0.000	0.000	0.000	0.000
Critical Value at 90%	172.85	172.58	51.8	51.8
Critical Value at 95%	193.2	179.58	55.75	55.75

Notes: (a) We exclude the oversample of blacks, hispanics, poor whites, the military sample, and those currently enrolled in college. In each case the the null hypothesis is the joint insignificance of the ability loadings on the respective block of the measurement system; (b)150 degrees of freedom ; (c)150 degrees of freedom; (d) 40 degrees of freedom; (e) 40 degrees of freedom.

Table S25. Cognitive and Noncognitive Factors for the Structural Model  
NLSY79 Children and Young Adults (CNLSY)

Outcomes (Model)	Males		Females	
	Cognitive	Noncognitive	Cognitive	Noncognitive
<i>A. Wages</i> <sup>(a)</sup>				
No High School Degree	0.014 (0.023)	0.027 (0.018)	0.044 (0.022)	-0.016 (0.017)
High School Degree	0.011 (0.019)	0.013 (0.015)	0.018 (0.023)	0.007 (0.014)
Beyond High School	-0.018 (0.058)	-0.046 (0.049)	0.045 (0.036)	0.072 (0.032)
<i>B. Other Outcomes</i> <sup>(b)</sup>				
High School Graduation	0.225 (0.039)	0.054 (0.031)	0.294 (0.047)	-0.002 (0.032)
Smoking	-0.048 (0.042)	-0.048 (0.036)	-0.038 (0.053)	-0.063 (0.038)
Alcohol	0.053 (0.048)	-0.004 (0.039)	0.012 (0.053)	-0.020 (0.039)
Marijuana	-0.032 (0.045)	-0.016 (0.039)	-0.007 (0.058)	0.060 (0.042)
Ever Convicted	-0.057 (0.036)	-0.012 (0.029)	-0.007 (0.042)	0.011 (0.031)

Notes: (a) Wages are measured on the first job during which the individual is not enrolled in school. Educational status is measured at the same time as wages. The model includes age and race dummies. (b) High School Graduation is by age 19, Smoking indicates every having smoked a cigarette by age 18, Alcohol indicates every having drunk alcohol by age 18, Marijuana indicates every having smoked marijuana by age 18, Ever Convicted indicates ever having been convicted of a crime by age 18. The models include childhood residence and broken home dummy variables (both refer to the modal value from age 0 to 18), childhood family income (the mean from age 0 to 18), mother's highest grade completed and number of siblings (both refer to the highest amount by age 18), mother's age at birth, and race dummies. Standard errors in parentheses.

Table S26. Descriptive Statistics  
Age 30 Sample - NLSY79

Variables	Males				Females			
	Mean	Std. Dev.	Min	Max	Mean	Std. Dev.	Min	Max
Log of Hourly Wage <sup>(a)</sup>	2.62	0.53	0.34	5.80	2.34	0.56	-0.19	5.69
Employed (Dummy) <sup>(b)</sup>	0.90	0.30	0	1	0.71	0.46	0	1
White Collar Worker (Dummy) <sup>(c)</sup>	0.44	0.50	0	1	0.68	0.47	0	1
Local Unemployment Rate <sup>(d)</sup>	6.81	2.46	1.80	17.40	6.80	2.49	2	18
Urban Residence (Dummy)	0.76	0.43	0	1	0.77	0.42	0	1
Northeast Residence (Dummy)	0.18	0.39	0	1	0.18	0.38	0	1
Northcentral Residence (Dummy)	0.29	0.46	0	1	0.27	0.45	0	1
West Residence (Dummy)	0.17	0.37	0	1	0.16	0.37	0	1
High School Dropout (Dummy)	0.14	0.35	0	1	0.10	0.31	0	1
GED (Dummy)	0.08	0.27	0	1	0.08	0.27	0	1
High School Graduate (Dummy)	0.37	0.48	0	1	0.39	0.49	0	1
Some College--No Degree (Dummy)	0.13	0.34	0	1	0.14	0.35	0	1
2-Year College Degree (Dummy)	0.05	0.22	0	1	0.08	0.27	0	1
4-Year College Degree (Dummy)	0.23	0.42	0	1	0.21	0.41	0	1
Local Wage of High School Dropouts at Age 17	12.17	1.63	9.05	27.33	12.22	1.56	9.05	27.33
Local Wage of High School Graduates at Age 17	13.63	1.72	10.05	28.69	13.67	1.66	10.27	28.69
Local Wage of Attendees of Some College at Age 17	15.14	1.94	10.78	33.12	15.19	1.86	11.66	33.12
Local Wage of College Graduates at Age 17	20.53	2.52	15.13	40.22	20.58	2.45	15.88	40.22
Local Unemployment Rate of High School Dropouts at Age 17	0.11	0.03	0.04	0.25	0.11	0.03	0.04	0.25
Local Unemployment Rate of High School Graduates at Age 17	0.07	0.02	0.02	0.17	0.07	0.02	0.03	0.17
Local Unemployment Rate of Attendees of Some College at Age 17	0.05	0.02	0.02	0.12	0.05	0.02	0.02	0.12
Local Unemployment Rate of College Graduates at Age 17	0.03	0.01	0.01	0.16	0.03	0.01	0.01	0.16
Average (1993-2000) Testing Fee per GED Battery by State	22.02	17.55	0	53.43	22.39	17.60	0	53.43
Tuition at Two Year College at Age 17 (thousands)	1.17	0.72	0	4.81	1.16	0.73	0	4.70
Tuition at Four Year College at Age 17 (thousands)	2.04	0.84	0	5.546	2.03	0.86	0	5.546
Smoking Daily at Age 18 (Dummy) <sup>(e)</sup>	0.39	0.49	0	1	0.42	0.49	0	1
Marijuana Use in 1979 or 1980 (Dummy) <sup>(f)</sup>	0.51	0.50	0	1	0.47	0.50	0	1
Ever Been in Jail by Age 30 (Dummy) <sup>(g)</sup>	0.05	0.21	0	1	0.00	0.07	0	1
Illegal Index (Dummy) <sup>(h)</sup>	0.54	0.50	0	1	0.41	0.49	0	1
Single with No Children by Age 18 (Dummy) <sup>(i)</sup>	0.95	0.22	0	1	0.79	0.41	0	1
Single with Children by Age 18 (Dummy) <sup>(i)</sup>	0.02	0.14	0	1	0.08	0.27	0	1
Married with No Children by Age 18 (Dummy) <sup>(i)</sup>	0.01	0.12	0	1	0.06	0.24	0	1
Married with Children by Age 18 (Dummy) <sup>(i)</sup>	0.02	0.14	0	1	0.06	0.25	0	1
Black (Dummy)	0.12	0.32	0	1	0.13	0.33	0	1
Hispanic (Dummy)	0.07	0.25	0	1	0.07	0.25	0	1
Broken home at Age 14 (Dummy)	0.24	0.43	0	1	0.26	0.44	0	1
Number of Siblings	3.25	2.26	0	17	3.37	2.25	0	17
Father's Highest Grade Completed	11.81	3.46	0	20	11.59	3.37	0	20
Mother's Highest Grade Completed	11.60	2.61	0	20	11.40	2.71	0	20
Living in a Urban area at age 14 (Dummy)	0.76	0.43	0	1	0.77	0.42	0	1
Living in the South at age 14 (Dummy)	0.30	0.46	0	1	0.34	0.47	0	1
Family income in 1979 (thousands)	20.44	12.69	0	75.001	19.34	0.25	0	75.001
<b>ABILITY VARIABLES</b>								
<i>Cognitive Skills</i>								
Arithmetic Reasoning (ASVAB 1)	18.03	7.50	0	30	16.39	6.88	2	30
Word Knowledge (ASVAB 2)	24.97	8.00	0	35	25.27	7.58	0	35
Paragraph Comprehension (ASVAB 3)	10.24	3.61	0	15	10.96	3.25	0	15
Mathematical Knowledge (ASVAB 4)	13.33	6.54	0	25	12.94	6.13	0	25
Coding Speed (ASVAB 5)	40.80	15.41	0	84	48.48	15.54	0	84
<i>Noncognitive Skills</i>								
Rotter Locus of Control Scale	2.86	0.60	1	4	2.83	0.60	1	4
Rosenberg Self-Esteem Scale	3.25	0.40	2	4	3.22	0.42	1.7	4
<b>Number of Observations</b>	<b>2255</b>				<b>2425</b>			

Notes: We exclude the oversample of blacks, Hispanics, poor whites, the military sample, and those currently enrolled in college. Arithmetic reasoning, Word Knowledge, Paragraph Comprehension, Math Knowledge, and Coding Speed correspond to scores on the ASVAB series of achievement tests. Rotter Locus of Control Scale and Rosenberg Self-Esteem Scale correspond to scores on these measures. Father's education, mother's education, and number of siblings all refer to the level at age 17. The Illegal Index indicates whether an individual participated in any of the following illegal activities in 1979 or 1980: attempting to "con" someone, taking a vehicle without the owner's permission, shoplifting, intentionally damaging another person's property, or using force to obtain things.

(a) The sample sizes for this variable are 2107 and 2035 for men and women, respectively. (b) The sample sizes for this variable are 2143 and 2331 for men and women, respectively. (c) The sample sizes for this variable are 2051 and 1907 for men and women, respectively. (d) The sample sizes for these variables is 2147 and 2320 for men and women, respectively. (e) The sample sizes for these variables is 2206 and 2386 for men and women, respectively. (f) The sample sizes for these variables is 2182 and 2371 for men and women, respectively. (g) The sample sizes for these variables is 2252 and 2423 for men and women, respectively. (h) The sample sizes for these variables is 2162 and 2351 for men and women, respectively. (i) The sample sizes for these variables is 2253 and 2421 for men and women, respectively.

Table S27. Rotter Internal-External Locus of Control Scale

**Question 1 (Rotter 1)**

- (a) What happens to me is my own doing.
- (b) Sometimes I feel that I don't have enough control over the direction my life is taking.

**Question 2 (Rotter 2)**

When I make plans,

- (a) I am almost certain that I can make them work.
- (b) It is not always wise to plan too far ahead, because many things turn out to be a matter of good or bad fortune anyhow.

**Question 3 (Rotter 3)**

- (a) Getting what I want has little or nothing to do with luck.
- (b) Many times we might just as well decide what to do by flipping a coin

**Question 4 (Rotter 4)**

- (a) Many times I feel that I have little influence over the things that happen to me.
- (b) It is impossible for me to believe that chance or luck plays an important role in my life.

## Table S28. Rosenberg Self-Esteem Scale

### **Question 1**

I feel that I'm a person of worth, at least on an equal basis with others.

### **Question 2**

I feel that I have a number of good qualities.

### **Question 3**

All in all, I am inclined to feel that I am a failure.

### **Question 4**

I am able to do things as well as most other people.

### **Question 5**

I feel I do not have much to be proud of.

### **Question 6**

I take a positive attitude toward myself.

### **Question 7**

On the whole, I am satisfied with myself.

### **Question 8**

I wish I could have more respect for myself.

### **Question 9**

I certainly feel useless at times.

### **Question 10**

At times I think I am no good at all.