

# The Productivity Argument For Investing In Young Children

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James Heckman  
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# Why Invest In Poor Children?

The traditional argument is based on fairness and social justice

My argument is that in addition to these benefits, there are benefits for society at large

- Reduction in crime
- Reduction in welfare benefit use
- Improvement in efficiency of schools

# Why Early Childhood Interventions?

- Skill acquisition is a dynamic process: skill begets skill
- Raises productivity of schools and firms
- Adult remediation programs have a poor track record
- There is strong evidence for critical or sensitive periods for learning

# The Argument in a Nutshell

- I. Many major economic and social problems can be traced to low levels of skill and ability in the population.
- II. Abilities are multiple in nature.
- III. Much public policy discussion focuses on cognitive ability (IQ).
- IV. Yet noncognitive abilities are also very important.
- V. They feed in to performance on achievement tests and in society at large.

- VI. Early family environments are major predictors of both types of ability.
- VII. A source of concern because family environments have deteriorated over the past 40 years.
- VIII. Experiments support the notion that the correlational relationships are causal.
- IX. If we intervene early enough we can affect both cognitive and noncognitive abilities.
- X. Promote schooling, reduce crime, promote productivity in the workplace and reduce teenage pregnancy.

- XI. High benefit cost ratios and rates of return.
- XII. Much higher returns than to other, later interventions (pupil teacher ratios; public job training; convict rehabilitation programs; direct expenditure on police).

# Slowdown in the Growth of Labor Force Quality

- Slowdown in the growth of the quantity of skilled workers
- Slowdown in the growth of the quality of workers
- The effective high school dropout rate counting GEDs as dropouts (as you should) has increased

# Table 1

## Educational Characteristics of the Labor Force

**Age 25 and Over**  
**1980, 2000, 2020**

	Labor Force in 1980	<b>Growth</b> <b>1980</b> <b>-2000</b>	Labor Force in 2000	<b>Growth</b> <b>2000</b> <b>-2020</b>	Labor Force in 2020
<b>Education</b>					
Less Than High School	17.3	-5.3	12.0	0.9	12.9
High School Only	31.5	6.3	37.8	3.8	41.6
Some Schooling Beyond High School	13.8	19.1	32.9	6.2	39.1
College Degree or More	17.3	18.5	35.8	7.7	43.5
<b>Total</b>	<b>79.8</b>	<b>38.7</b>	<b>118.5</b>	<b>18.6</b>	<b>137.1</b>
% With College Degree	21.6%		30.2%		31.7%

\*Assumes that subsequent cohorts have same education at age 25 as the cohort age 25 in 2000.

Source: Ellwood (2001).

# Literacy and Numeracy from IALS

- Over 20% of the US workforce is functionally illiterate, compared to about 10% in Germany and Sweden
- 20% of all adults say that the sun goes around the earth

# Crime

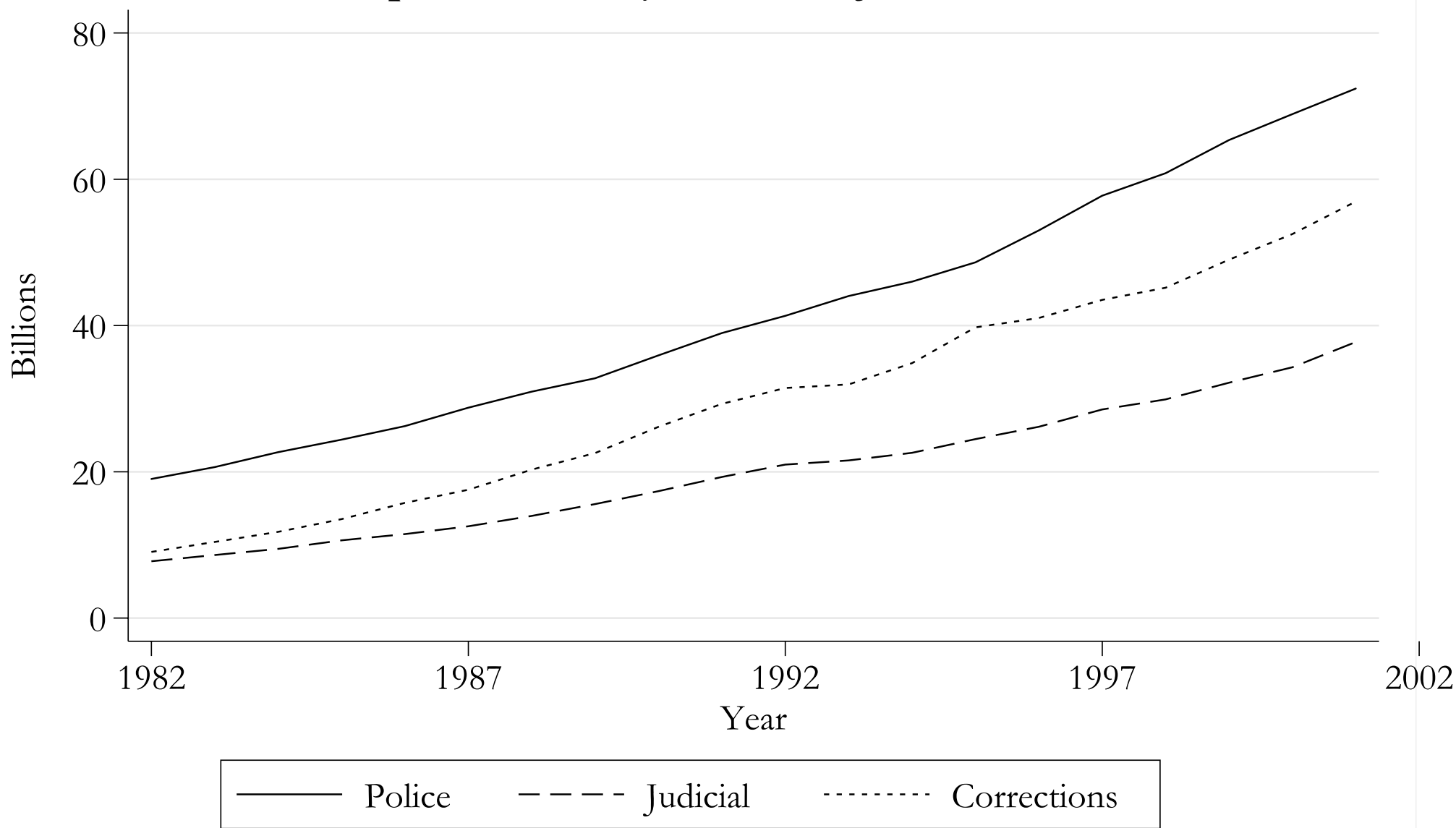
- Anderson (1999) finds that the **net** cost of crime is \$1.3 T per year
- Per capita cost is \$4,818 per year
- Violent and property crime levels are still high, despite large declines in recent years
- Crime reduction is **extremely** expensive
- Spending on the criminal justice system is still increasing

**Table 2. Aggregate Burden Of Crime**

Crime-induced Production (\$ billion)	464
Opportunity Costs (\$ billion)	152
Risks to Life And Health (\$ billion)	672
Transfers (\$ billion)	706
Gross Burden (\$ billion)	1,995
Net of Transfers (\$ billion)	1,289
Per Capita (\$)	4,818

Source: Anderson (1999). All figures inflated to \$2004 using the CPI.

Figure 1  
Total Direct Expenditures By Criminal Justice Function, 1982–2001

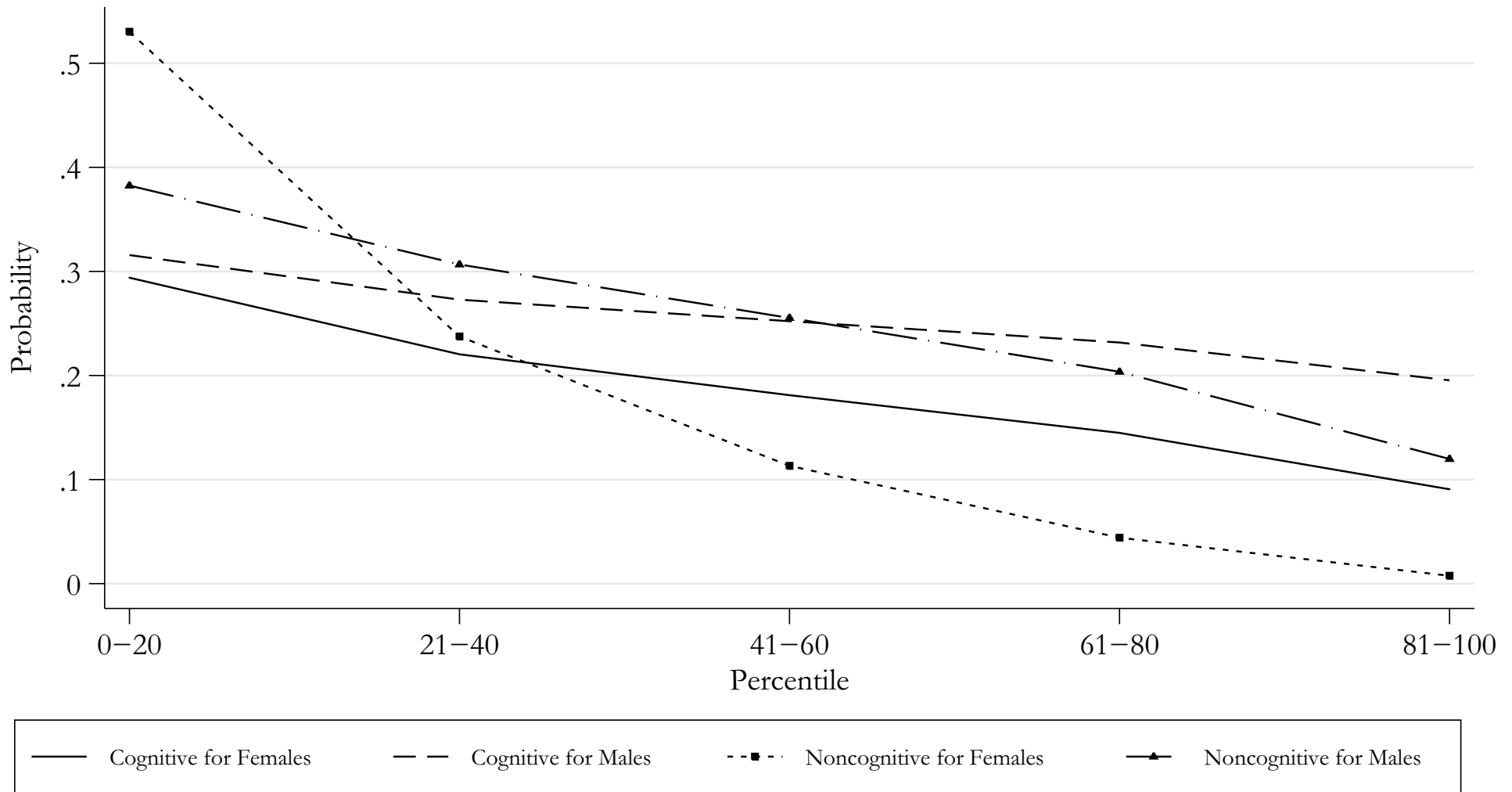


Source: Justice Expenditure and Employment Extracts.

# Ability And Outcomes

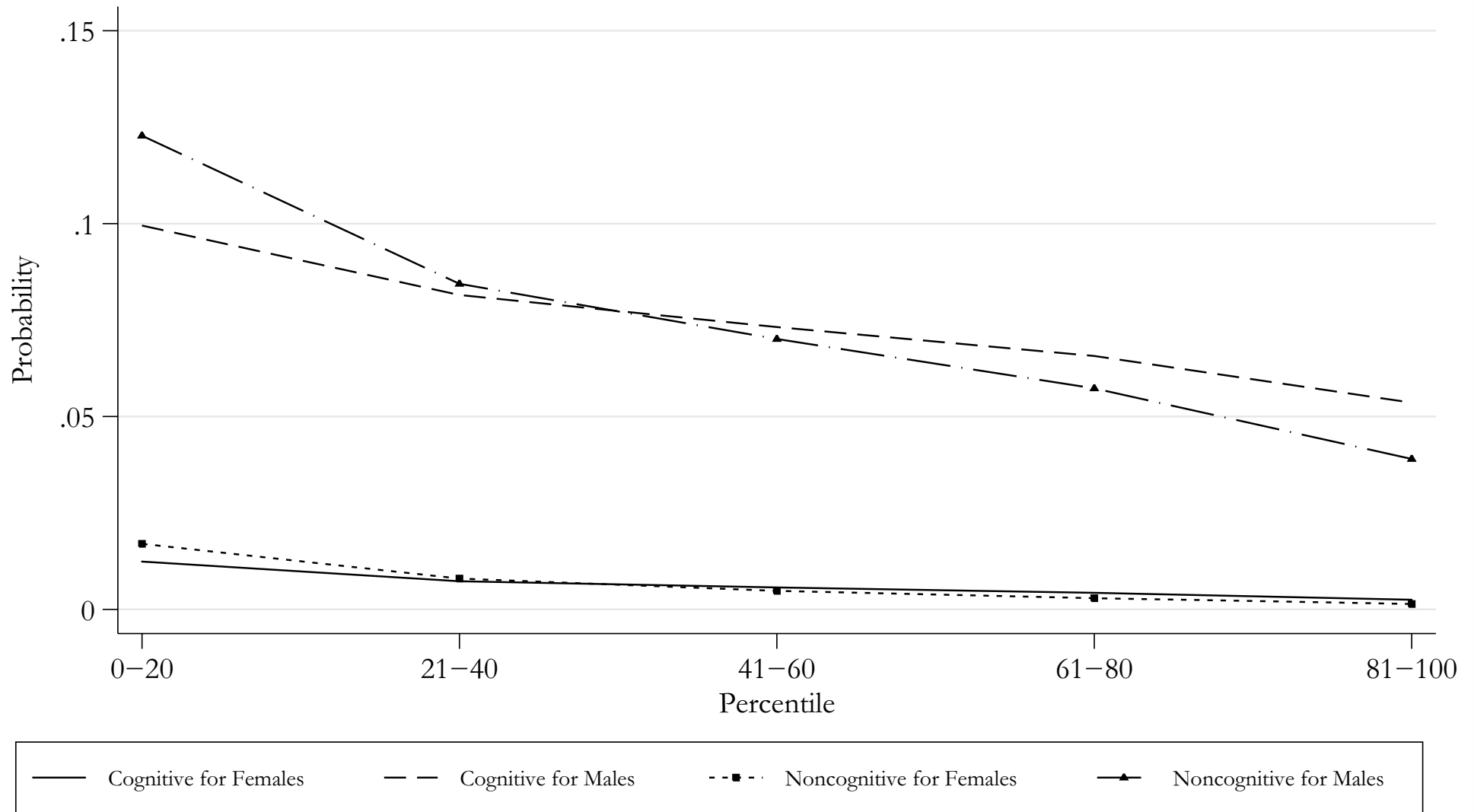
- Cognitive and noncognitive ability are both important in explaining schooling, crime and a variety of other outcomes
- Noncognitive ability is neglected in many public policy discussions regarding early childhood
- Yet noncognitive ability is a major determinant of socioeconomic success

Figure 2a  
Probability of Being a High School Dropout and Increased Ability



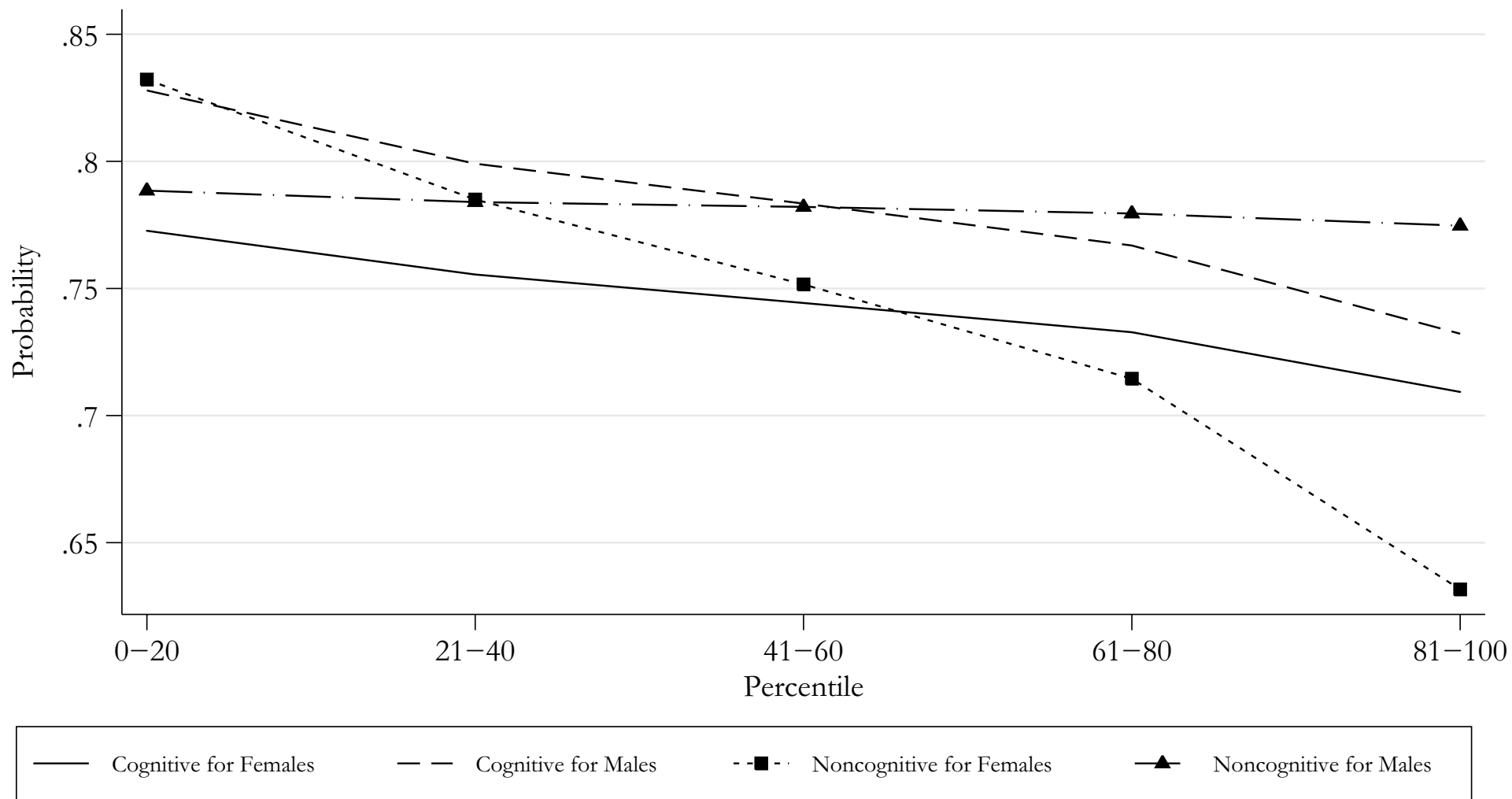
Note: This figure plots the probability of a given behavior associated with moving up in one ability distribution for someone with mean ability in the other distribution. For example, the lines with markers show the effect of increasing noncognitive ability for someone with average cognitive ability. Source: Heckman, Stixrud, and Urzua (2004).

Figure 2b  
 Probability of Spending Time in Jail by Age 30 and Increased Ability



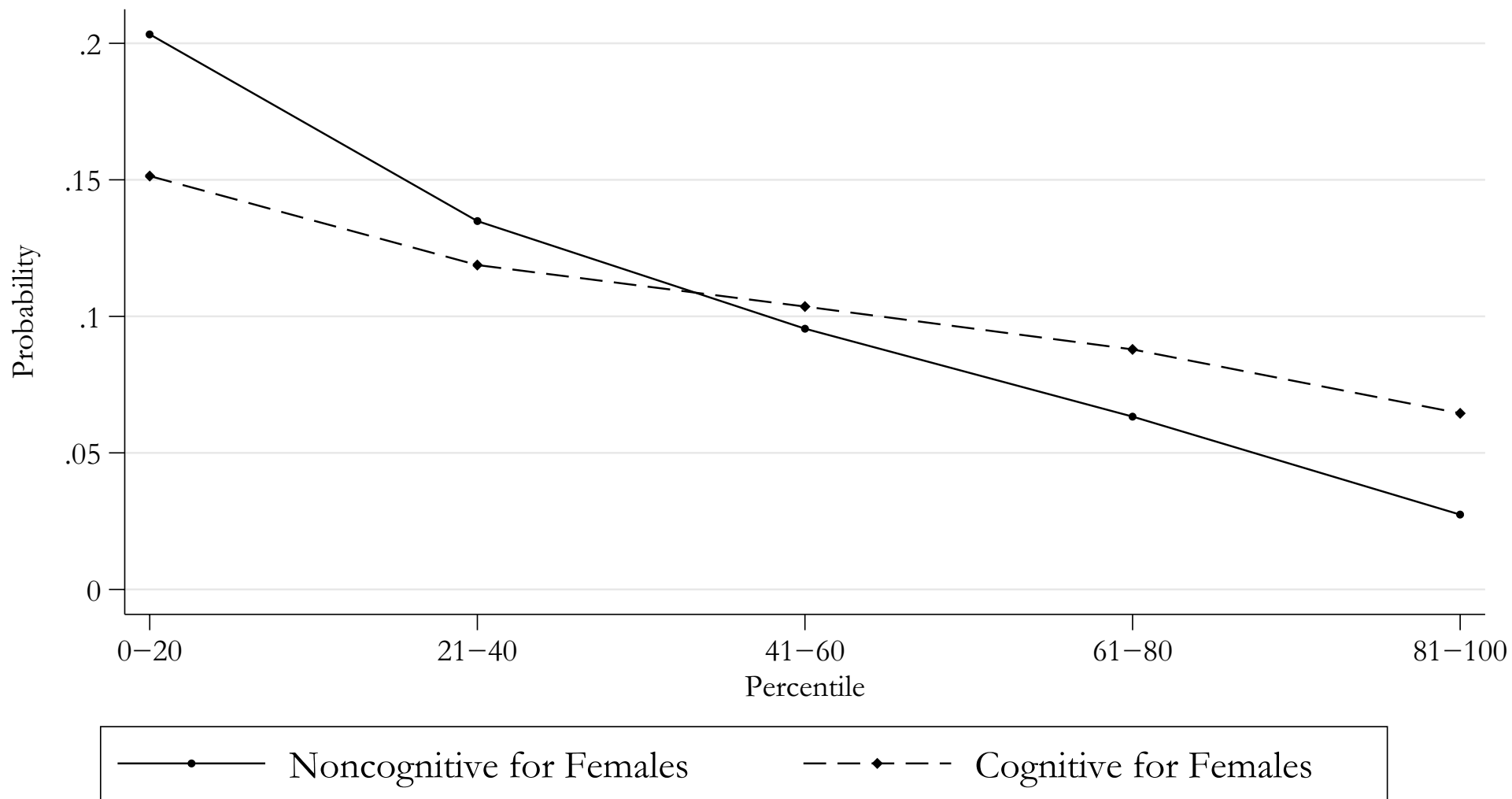
Note: This figure plots the probability of a given behavior associated with moving up in one ability distribution for someone with mean ability in the other distribution. For example, the lines with markers show the effect of increasing noncognitive ability for someone with average cognitive ability. Source: Heckman, Stixrud, and Urzua (2004).

Figure 2c  
Probability of Trying Smoking by Age 18 and Increased Ability



Note: This figure plots the probability of a given behavior associated with moving up in one ability distribution for someone with mean ability in the other distribution. For example, the lines with markers show the effect of increasing noncognitive ability for someone with average cognitive ability. Source: Heckman, Stixrud, and Urzua (2004).

Figure 2d  
 Probability of Being Single with Child and Increased Ability

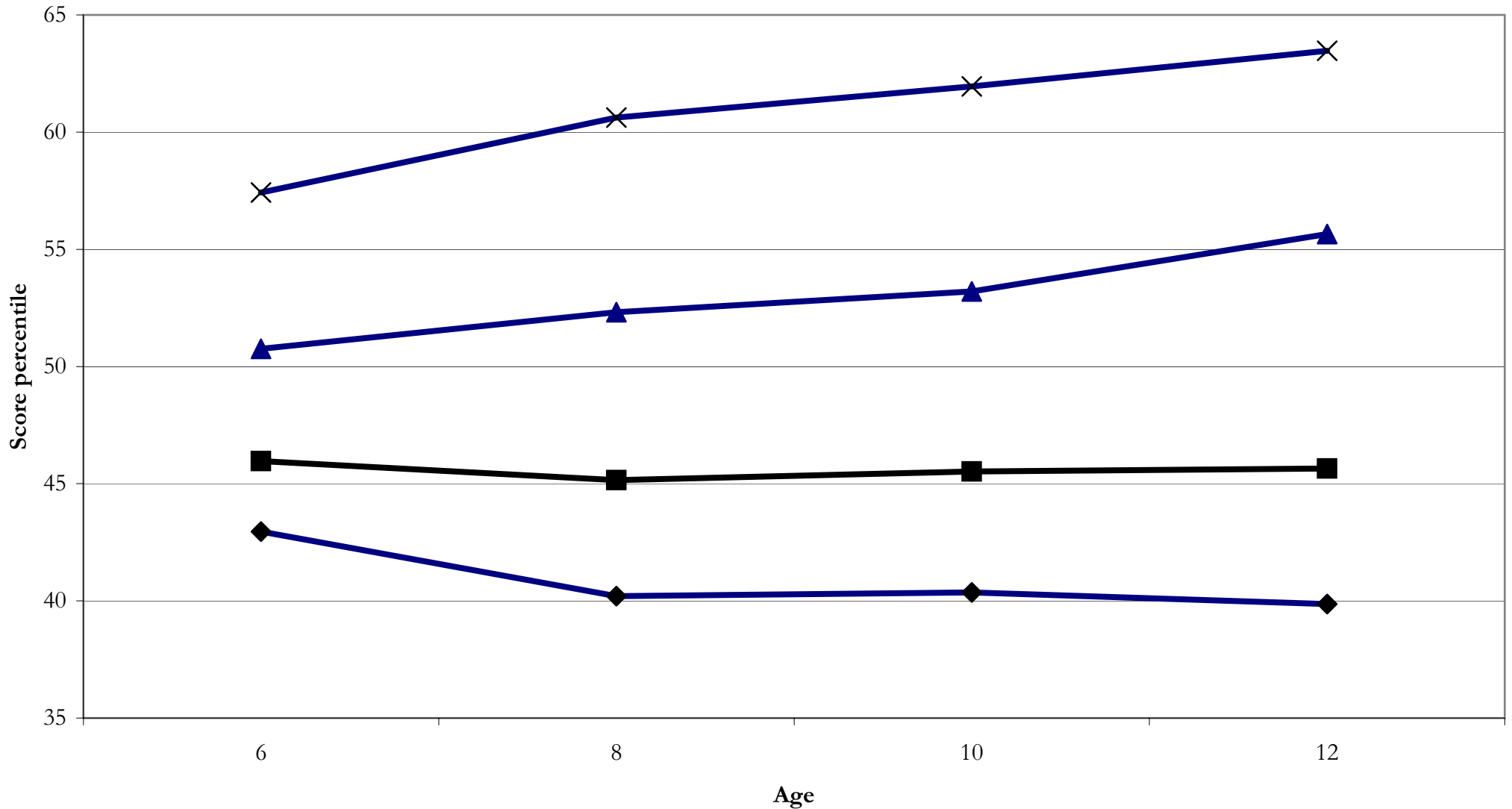


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# Gaps In Ability Open Up Early

# Figure 3a Children of NLSY

Average percentile rank on PIAT-Math score, by income quartile\*

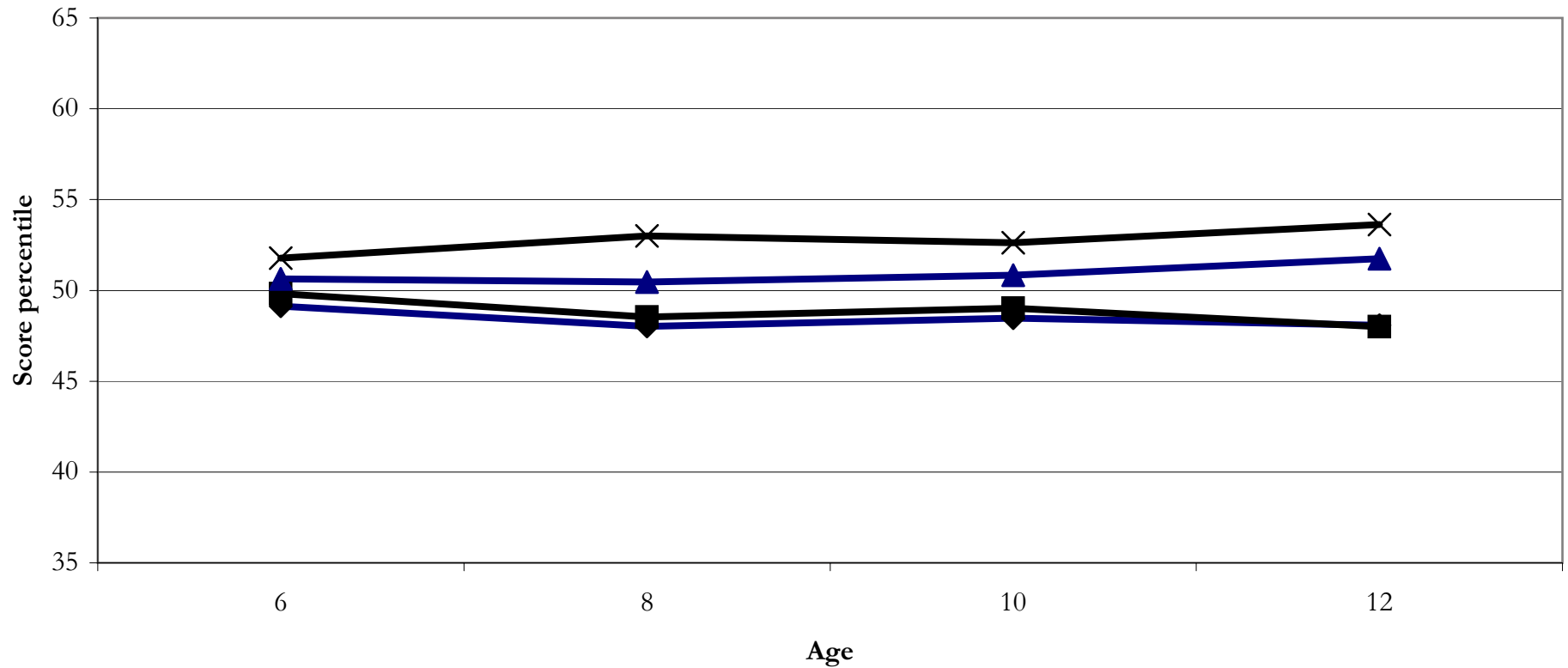


\*Income quartiles are computed from average family income between the ages of 6 and 10.

◆ Lowest income quartile   ■ Second income quartile   ▲ Third income quartile   ✕ Highest income quartile

# Figure 3b Children of NLSY

Adjusted average PIAT-Math score percentiles by income quartile\*

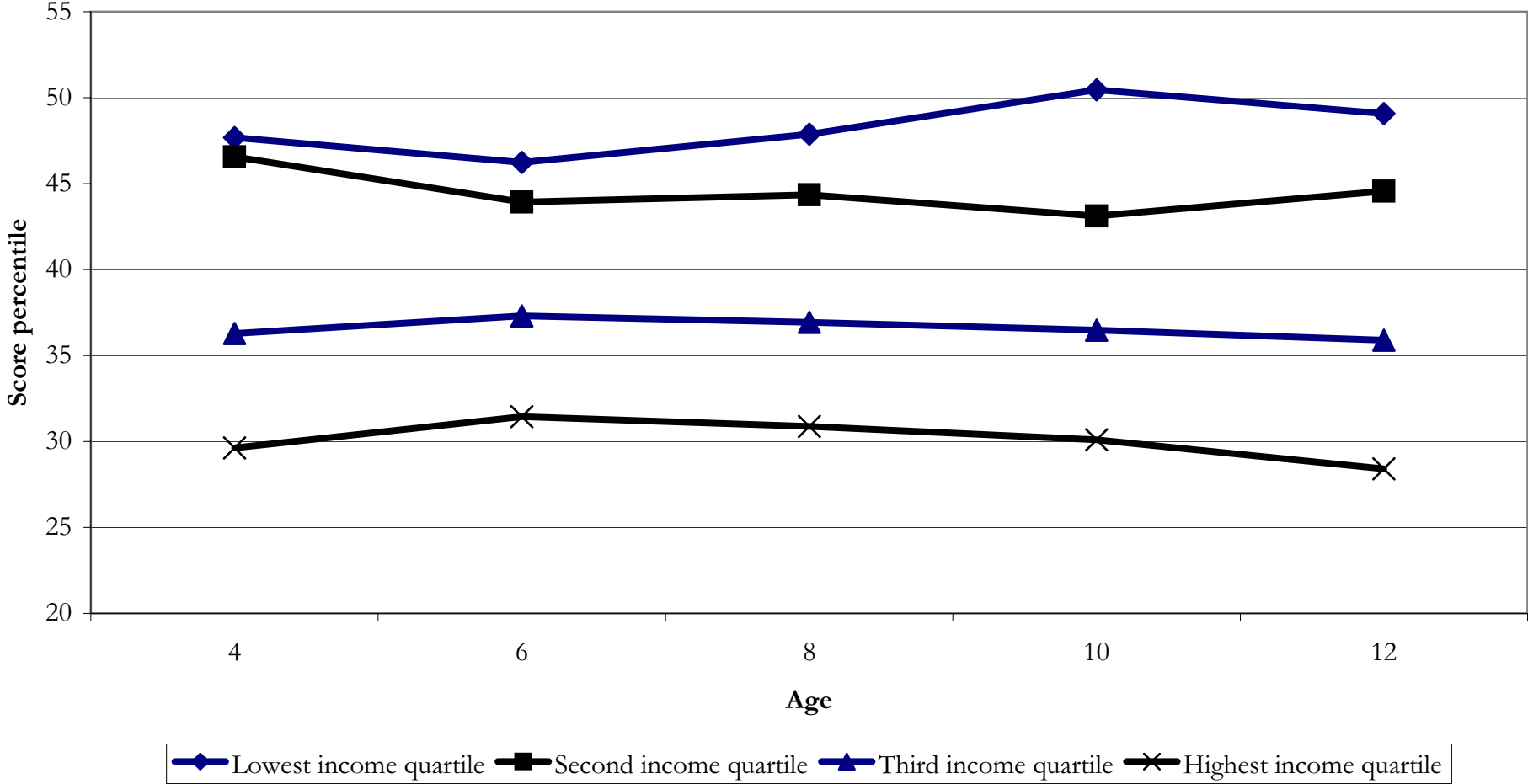


\* Adjusted by maternal education, maternal AFQT (corrected for the effect of schooling) and broken home at each age

◆ Lowest income quartile    ■ Second income quartile    ▲ Third income quartile    ✕ Highest income quartile

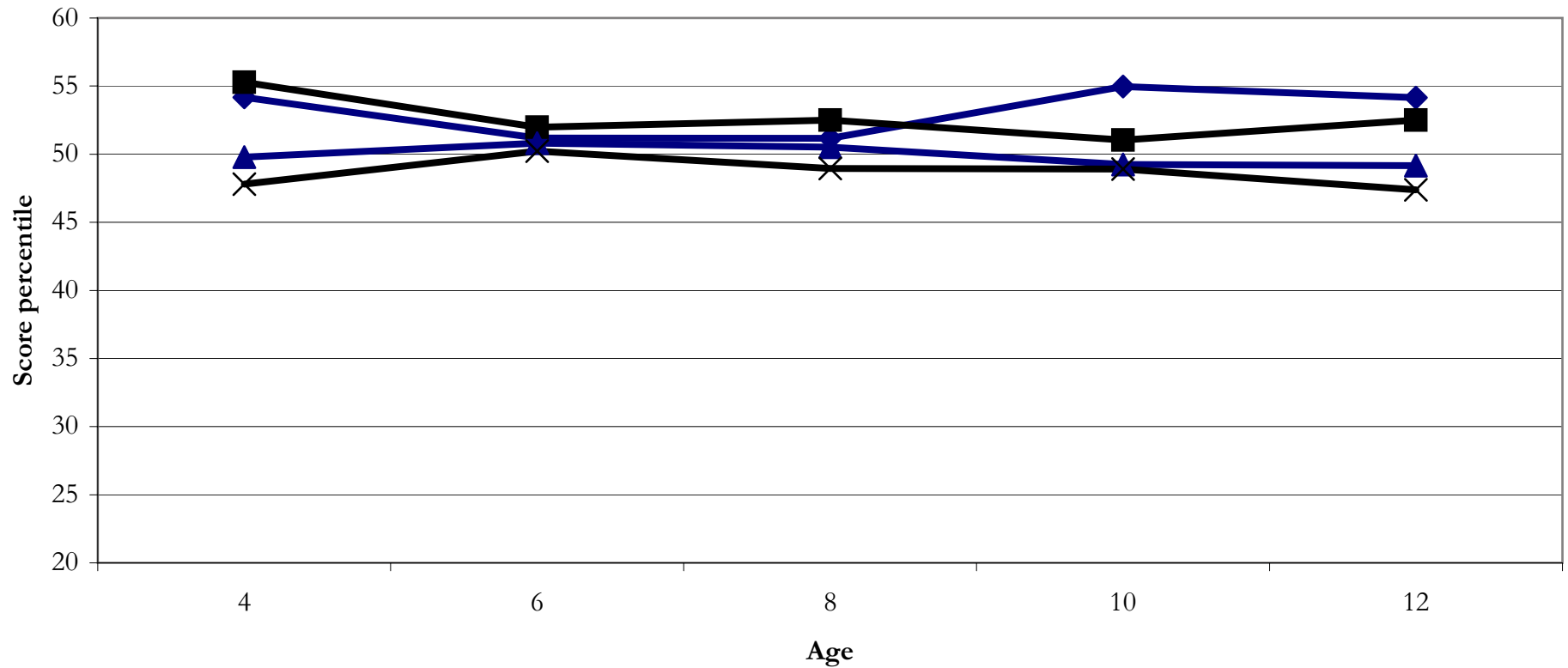
Once we control for family background, the gaps in ability greatly diminish

Figure 3c  
Children of NLSY  
Average percentile rank on anti-social score, by income quartile\*



# Figure 3d Children of NLSY

Adjusted average anti-social score percentile by income quartile\*



\* Adjusted by maternal education, maternal AFQT (corrected for the effect of schooling) and broken home at each age

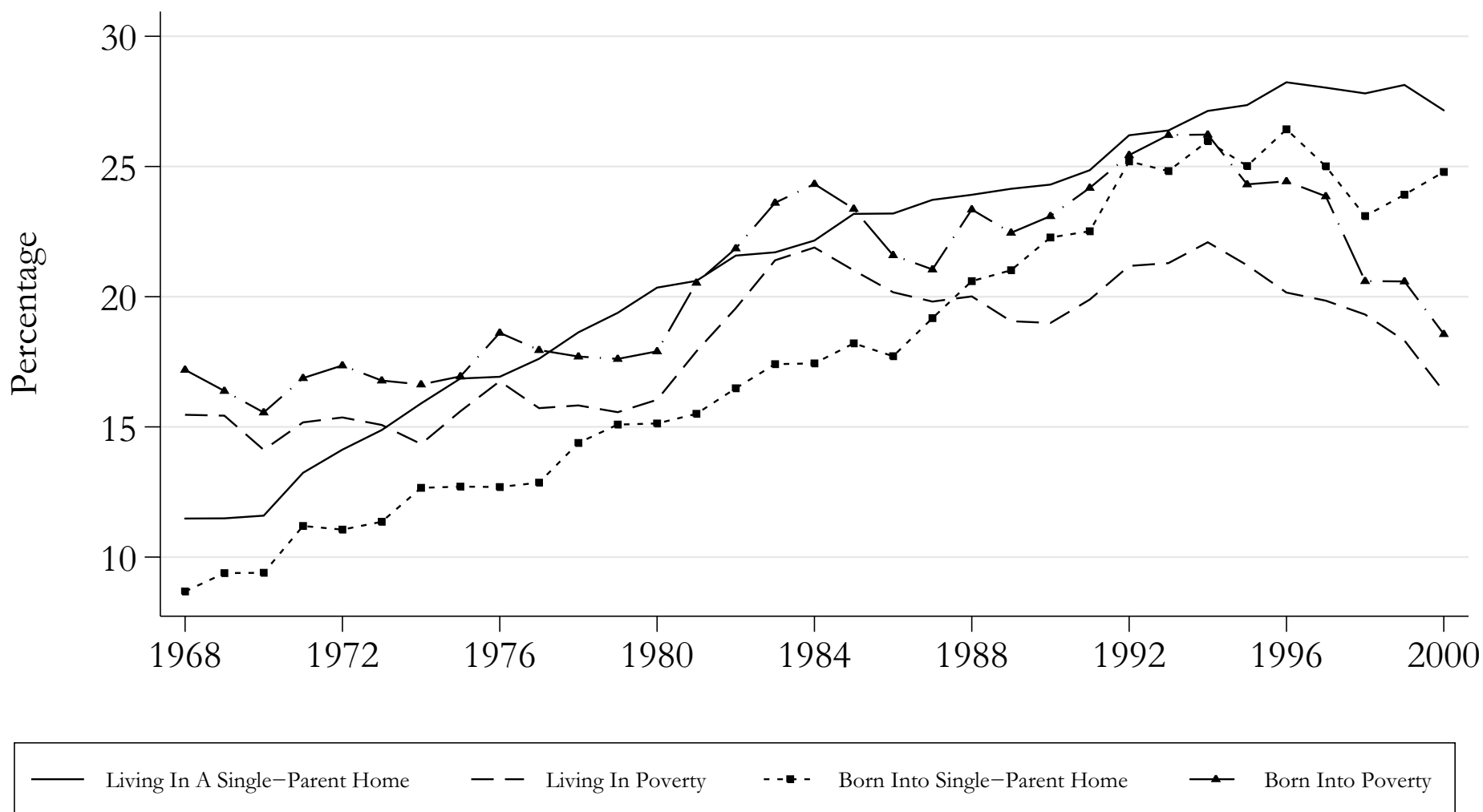
—◆— Lowest income quartile    —■— Second income quartile    —▲— Third income quartile    —×— Highest income quartile

# Early Family Environments

- Major predictors of abilities (both cognitive and noncognitive)
- A source of concern because they have deteriorated over the past 30 years
- Relatively more children born into disadvantaged environments

# Figure 4

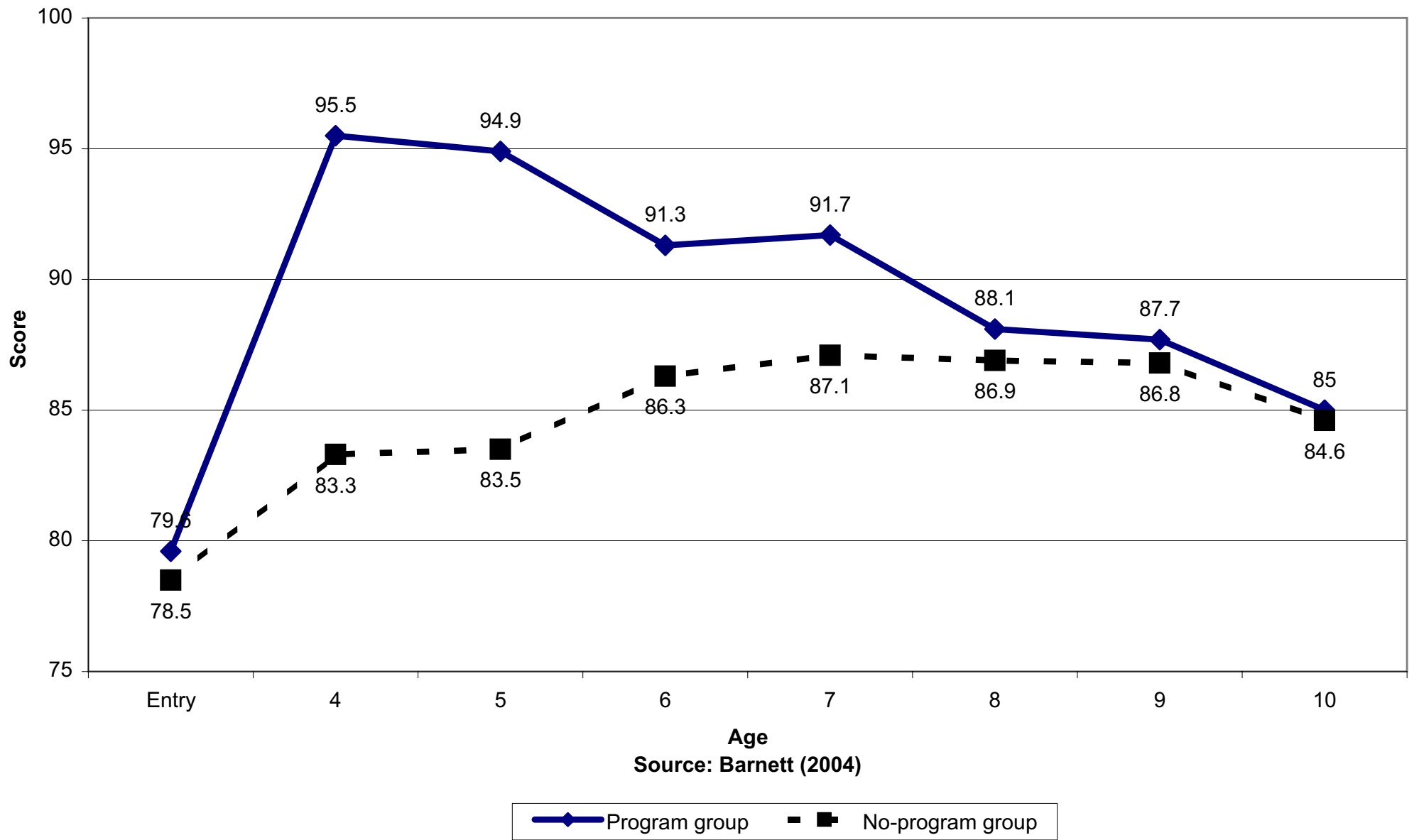
## Percentage Of All Children Born Or Living In Adverse Environments In Each Year, 1968–2000



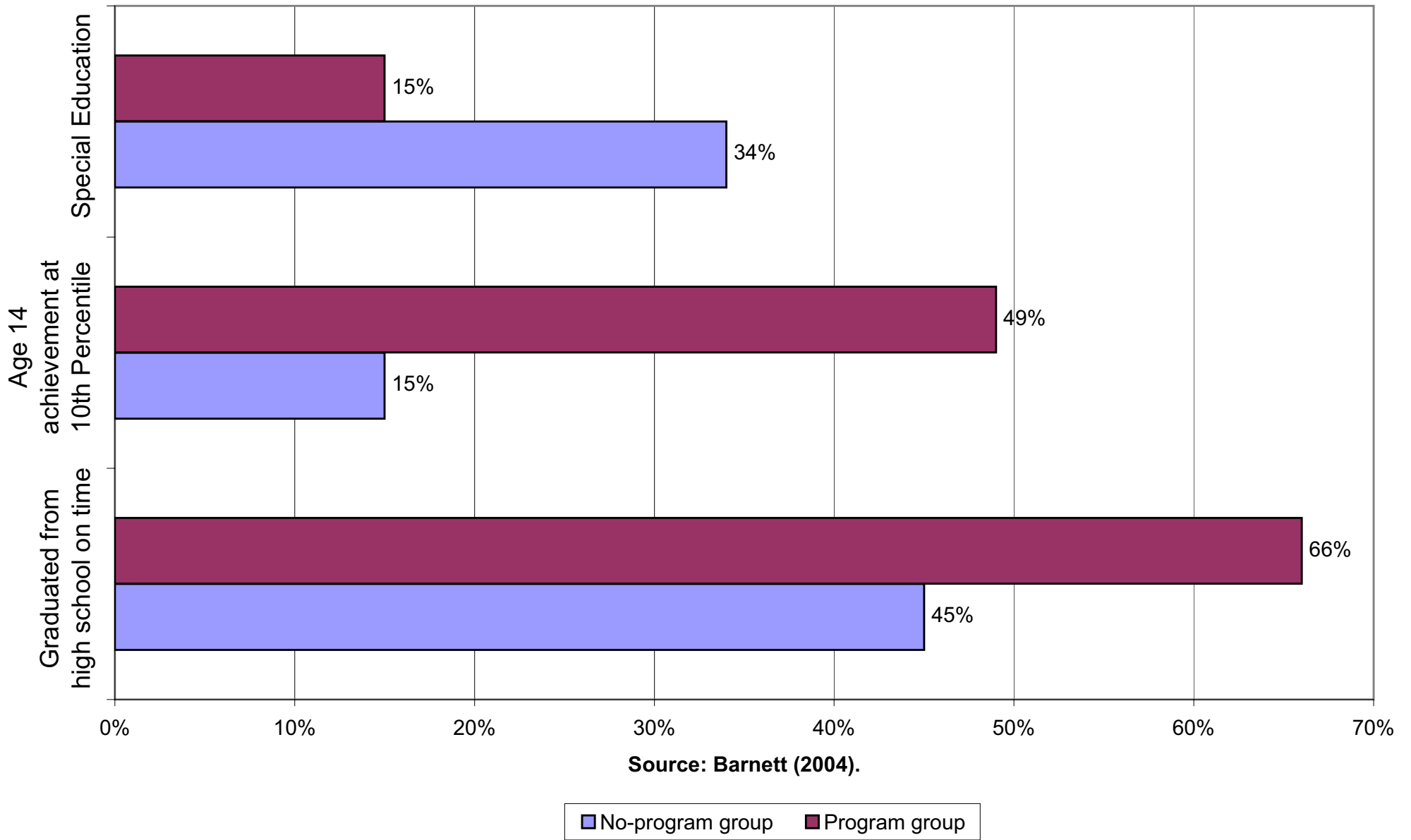
Source: Current Population Survey Annual March Supplement, 1968–2000. Poverty is defined as living in a household with income below the federal poverty line, which is adjusted for age and number of family members. Single-parent homes include cohabiting partners.

- Experiments indicate that these relationships are causal.
- Improvements in family environments enhance outcomes and affect both cognitive and noncognitive skills.
- If we start early with enriched programs, we can even raise IQ.

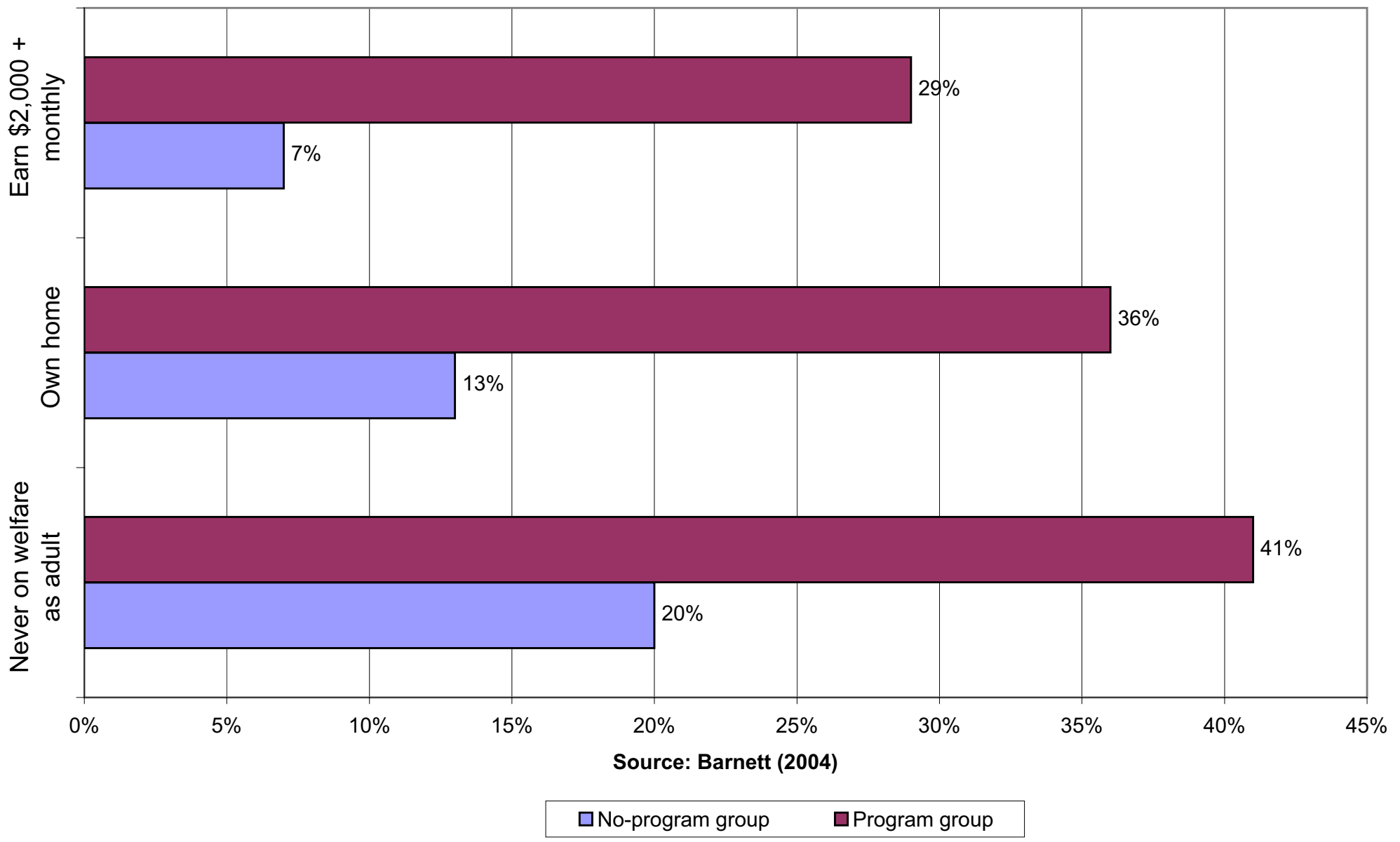
**Figure 5a**  
**Perry Preschool IQ Over Time**



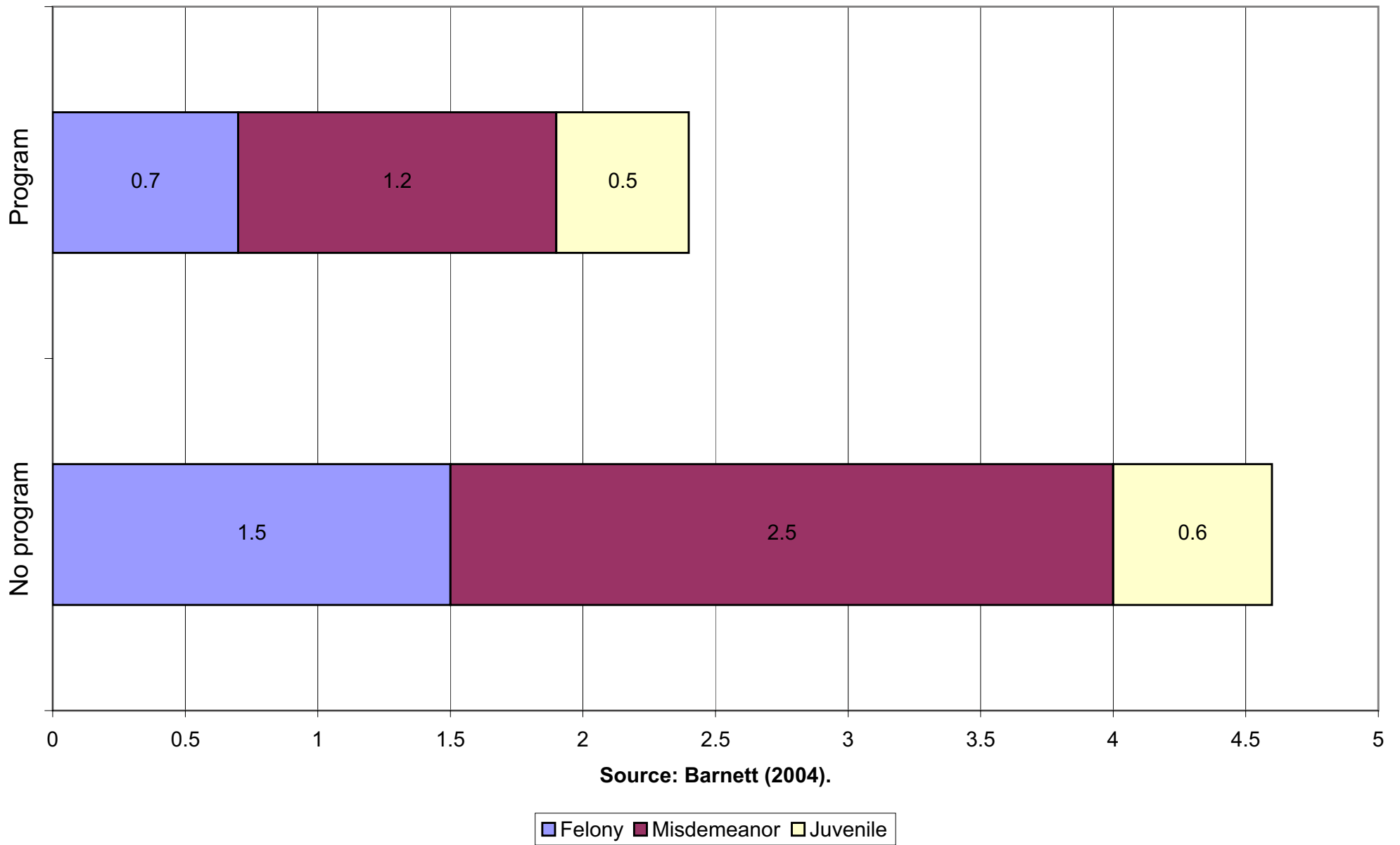
**Figure 5b**  
**Perry Preschool: Educational Effects**



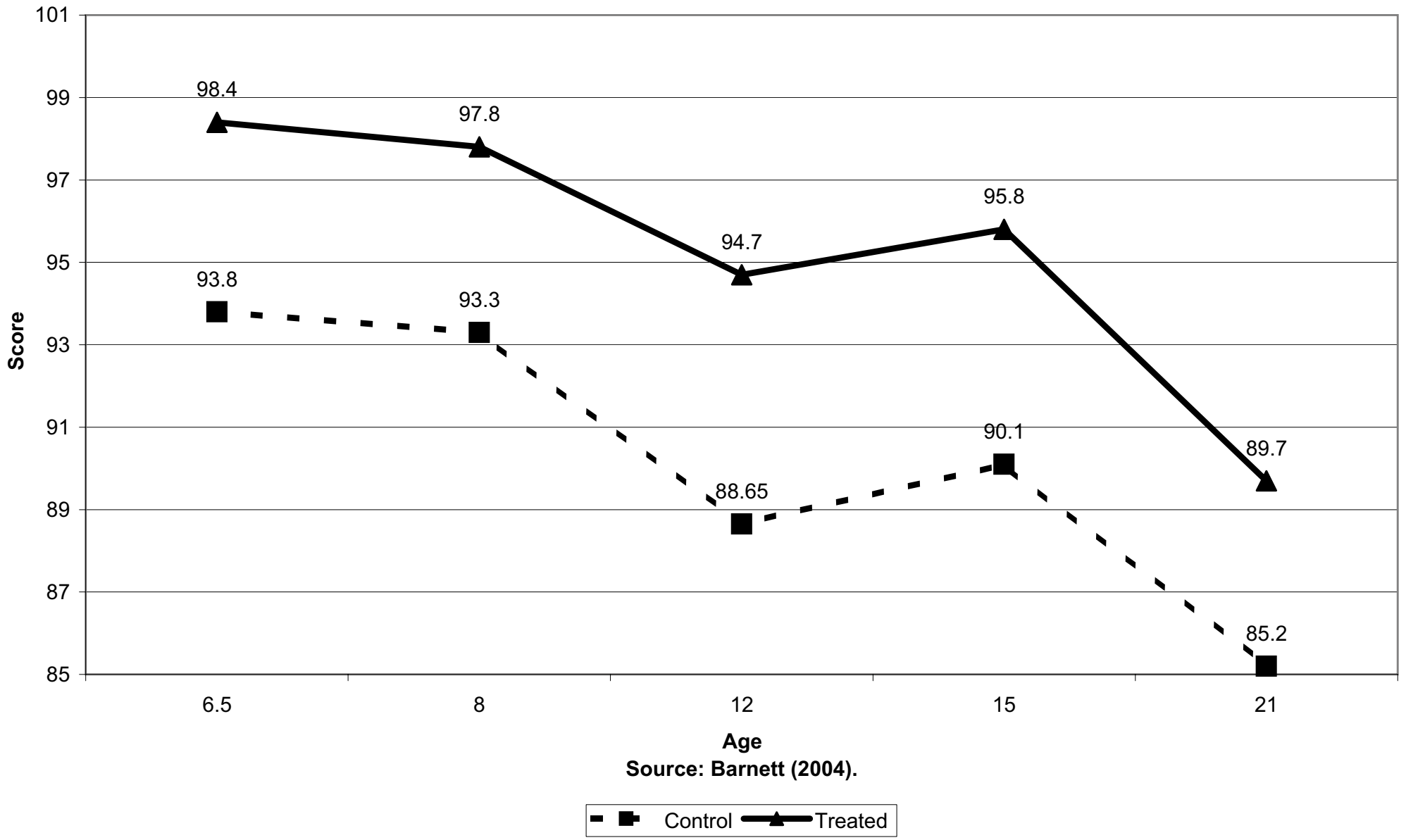
**Figure 5c**  
**Perry Preschool: Economic Outcomes**



**Figure 5d**  
**Perry Preschool: Arrests Per Person by Age 27**



**Figure 6a**  
**Abecedarian IQ Scores Over Time**



**Figure 6b**  
**Abecedarian Academic Outcomes**

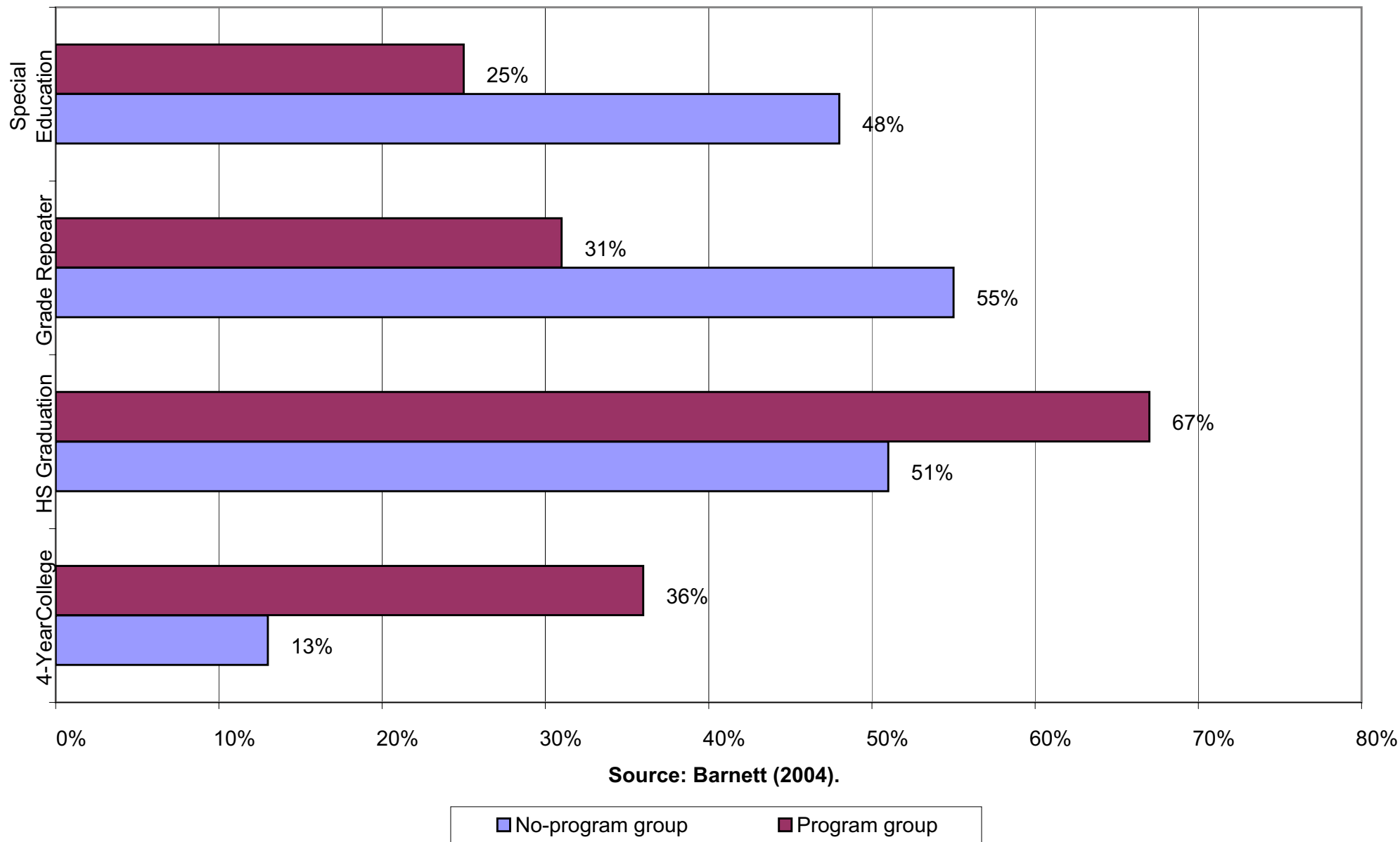
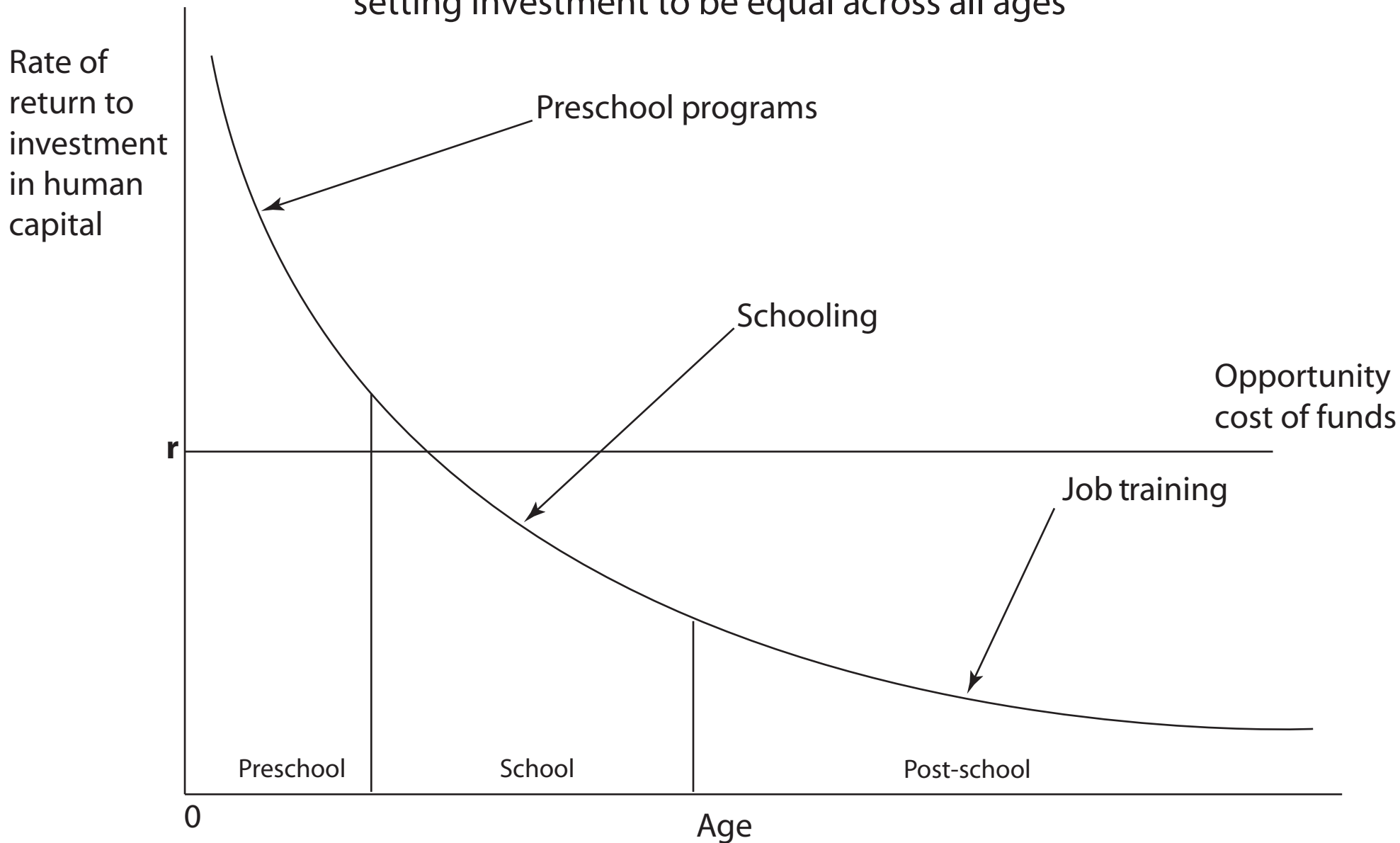


Figure 7

Rates of return to human capital investment initially setting investment to be equal across all ages



Rates of return to human capital investment initially setting investment to be equal across all ages

Table 3. Economic Benefits And Costs

	Perry	Chicago CPC
Child Care	986	1,916
Earnings	40,537	32,099
K-12	9,184	5,634
College/Adult	-782	-644
Crime	94,065	15,329
Welfare	355	546
FG Earnings	6,181	4,894
Abuse/Neglect	0	344
Total Benefits	150,525	60,117
Total Costs	16,514	7,738
Net Present Value	134,011	52,380
Benefits-To-Costs Ratio	9.11	7.77

Notes: All values discounted at 3% and are in \$2004. Numbers differ slightly from earlier estimates because FG Earnings for Perry and Chicago were estimated using the ratio of FG Earnings Effect to Earnings Effect (about 15%) that was found in Abecedarian

Source: Barnett, 2004.

# Summary

- I. Many major economic and social problems can be traced to low levels of skill and ability in the population.
- II. Abilities are multiple in nature.
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## Additional Reading:

Flavio Cunha, James J. Heckman, Lance Lochner, and Dimitriy V. Masterov. (2006). “Interpreting the Evidence on Life Cycle Skill Formation,” forthcoming in Finis Welch and Eric Hanushek, eds., *The Handbook of the Economics of Education*. Amsterdam: North Holland.

James Heckman and Dimitriy V. Masterov. (2005). “The Productivity Argument for Investing in Young Children,” Committee For Economic Development, working paper no. 5, available from <http://www.ced.org>.