



CENTER FOR THE ECONOMICS
OF HUMAN DEVELOPMENT
THE UNIVERSITY OF CHICAGO



Parental Responses to High-quality Interventions

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- 1 Program Design
- 2 Selected Treatment Effects on Later-life Outcomes
- 3 Methodology
- 4 Results for ABC
- 5 Results for Perry

Perry Preschool Project (Perry)

- ▶ Implemented years: 1962–1967
- ▶ 5 cohorts of 3–4 year olds; 123 participants
- ▶ Target population: African American children at risk for cultural deprivation
- ▶ Treatment lasted 1–2 years and included center-based care and home visits & parenting instruction

- ▶ Implemented years: 1972–1982
- ▶ 4 cohorts beginning at birth; 111 participants
- ▶ Target population fulfilled High Risk Index, including parents' IQ, father at home, etc.
- ▶ Treatment lasted 5 years and included center-based care, formula, diapers, health check-ups, and medical care

Eligibility Criteria

Criteria	ABC	Perry
African-American		✓
Own IQ	✓	✓
Special circumstances	✓ ¹	
Mother's Education	✓	✓
Mother's Employment		✓ ²
Mother's IQ	✓	
Father's Education	✓	✓
Father's Presence	✓	✓
Family Income	✓	
Father's Employment	✓	✓
Father's IQ	✓	
Housing Density		✓
Family on Welfare	✓	
Absence of Maternal Relatives	✓	
Sibling's IQ	✓ ³	
Sibling behind in School	✓	
Agency Referral	✓	
Mental Health Help	✓	

- 1 three children were classified as being in special health circumstances by the program administrators and were automatically placed in the treatment group –not taken into account in 13 items index.
- 2 if father absent.
- 3 if father absent.

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Selected Treatment Effects

	Treatment Effect	Asy, 1 Tail	Asy, 2 Tails	Perm, 1 Tail	Perm 2 Tails
ABC					
Females					
HS Grad	0.156	0.125	0.249	0.098	0.257
Years of Education	2.182	0.001	0.003	0.000	0.006
Works	0.039	0.378	0.756	0.256	0.759
Income	4939.819	0.251	0.503	0.257	0.530
Males					
HS Grad	0.186	0.090	0.181	0.029	0.223
Years of Education	0.881	0.076	0.151	0.022	0.172
Works	0.291	0.007	0.013	0.006	0.016
Income	15968.022	0.079	0.157	0.021	0.096

Note: this tables displays treatment effects of ABC in outcomes at age 30, as measured by the mean differences between the control and treatment groups. In all the calculations we control for a high-risk index of 13 items at baseline. Individuals were eligible to the program if they comply with 11 of these items. We present one and two-tailed adymptotic and permutation p - value's. The permutation p - value's are analogous to those in Heckman et al. (2010). We use number of siblings and a "mother works" indicator at baseline to construct the permutation orbits.

Selected Treatment Effects (contd)

Perry

	Treatment Effect	Asy, 1 Tail	Asy, 2 Tails	Perm, 1 Tail	Perm 2 Tails
Females					
HS Grad at Age 40	0.233	0.047	0.094	0.008	0.059
(-) Teen Parent	0.159	0.083	0.165	0.000	0.406
Income at 27	4828.682	0.189	0.378	0.061	0.329
Males					
HS Grad at Age 40	0.053	0.333	0.665	0.389	0.615
(-) Felonies at 27	0.870	0.048	0.096	0.038	0.054
Income at 27	2986.292	0.289	0.578	0.362	0.545

Note: this tables displays treatment effects of Perry in later life outcomes, as measured by the mean differences between the control and treatment groups. Felonies at age 27 and Teen Parent are reversed. In all the calculations we control for a socio-economic index, which was used in the randomization protocol, based on household density and parental education at baseline. We present one and two-tailed adymptotic and permutation $p - value$'s. The permutation $p - value$'s are analogous to those in Heckman et al. (2010). We use number of siblings and a "mother works" indicator at baseline to construct the permutation orbits.

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- ▶ Construct principal components to measure
 - ▶ Non-cognitive or Character Skills
 - ▶ Parenting Behavior
- ▶ Measure cognitive skills through IQ tests
- ▶ Laspeyres decomposition of treatment effects later in life
 - ▶ Parenting behavior, character, and cognitive skills as mediators

- ▶ D_i indicator of treatment for individual i
- ▶ $Y_{i,k}^d, M_{i,k}^d, V_{i,k}^d$ denote outcomes, measures, and an unobserved term for outcome k , in either treatment or control $d \in \{0, 1\}$
- ▶ Write counterfactual outcomes as

$$\begin{aligned} Y_{i,k}^0 + \beta_0^0 + \beta_k^0 M_{i,k}^0 + V_{i,k}^0 \\ Y_{i,k}^1 + \beta_0^1 + \beta_k^1 M_{i,k}^1 + V_{i,k}^1 \end{aligned} \quad (1)$$

- ▶ for $J = Y, M, V$, write outcomes, measures, and the observed term as

$$J_{i,k} = J_{i,k}^0(1 - D_i) + J_{i,k}^1 D_i \quad (2)$$

- ▶ Write k th outcome as

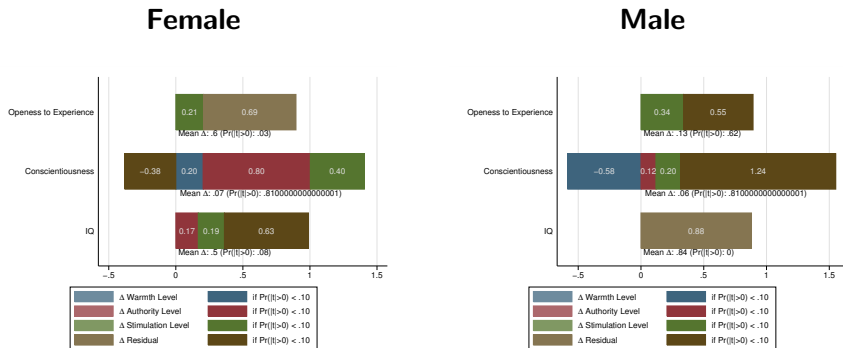
$$\begin{aligned} Y_{i,k} = & \beta_{0,k}^0 (1 - D_i) + \beta_{0,k}^1 D_i + [\beta_k^0 M_{i,k}^0] (1 - D_i) \\ & + [\beta_k^1 M_{i,k}^1] D_i + V_{i,k} \end{aligned} \quad (3)$$

- ▶ Assume $\beta_k^0 = \beta_k^1 \equiv \beta_k$
- ▶ Decompose the conditional mean as follows:

$$\underbrace{\mathbb{E}[Y_{i,k}^1 - Y_{i,k}^0 | D_i]}_{\text{Mean } \Delta} = \underbrace{\mathbb{E}[M_{i,k}^1 - M_{i,k}^0] \beta_k}_{\Delta \text{ Level}} + \underbrace{(\beta_{0,k}^1 - \beta_{0,k}^0)}_{\Delta \text{ Residual}} \quad (4)$$

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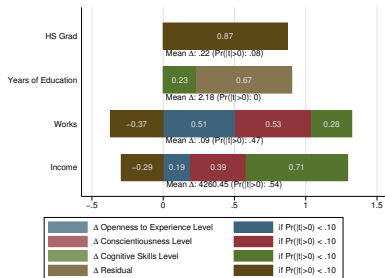
Parenting Behavior as Mediator of Early Skills



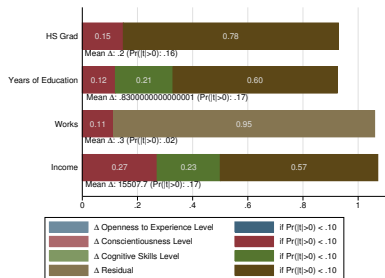
Note: this plot is a graphical display of a Laspeyres decomposition of the outcomes in the the y-axis in three different measures of parenting behavior. Below the bar we display the mean difference in the outcome. Then, we decompose the length of these changes, which we normalize to one, in the experimentally induced treatment effects in parenting behavior. We measure the outcomes as factors of extensive behavior batteries at ages 6, 7, and 8. We measure parenting behavior as factors of extensive parenting batteries at age 5.

Early Skills as Mediators of Later Life Outcomes

Female

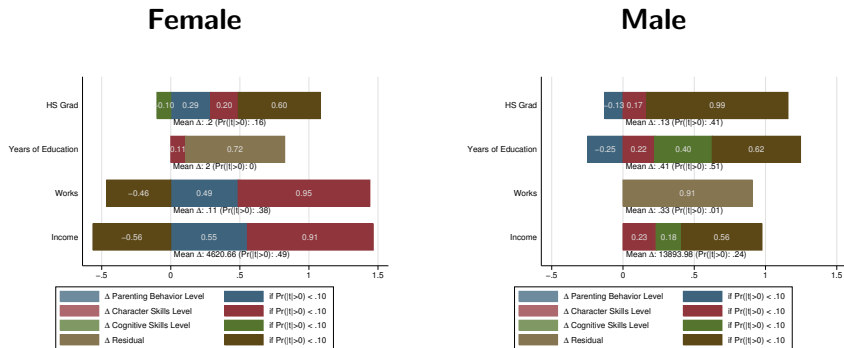


Male



Note: this plot is a graphical display of a Laspeyres decomposition of the outcomes in the the y-axis in three different skills. Below the bar we display the mean difference in the outcome. Then, we decompose the length of these changes, which we normalize to one, in the experimentally induced treatment effects in skills. All the outcomes are at age 30. We measure skills based on extensive behavior and intelligence measures at age 15.

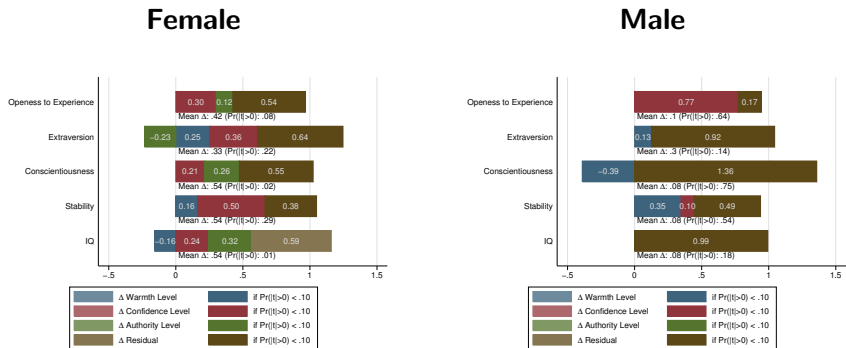
Early Skills and Parenting as Mediators of Later Life Outcomes



Note: this plot is a graphical display of a Laspeyres decomposition of the outcomes in the the y-axis in three different skills. Below the bar we display the mean difference in the outcome. Then, we decompose the length of these changes, which we normalize to one, in the experimentally induced treatment effects in skills. All the outcomes are at age 30. We measure skills based on extensive behavior and intelligence measures at age 15.

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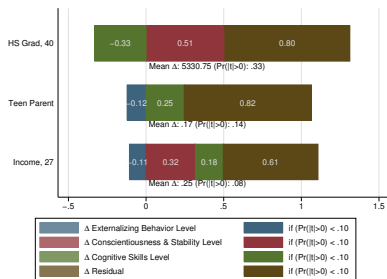
Parenting Behavior as Mediator of Early Skills



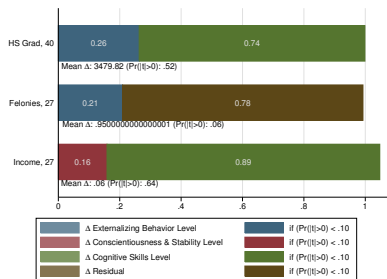
Note: this plot is a graphical display of a Laspeyres decomposition of the outcomes in the the y-axis in three different measures of parenting behavior. Below the bar we display the mean difference in the outcome. Then, we decompose the length of these changes, which we normalize to one, in the experimentally induced treatment effects in parenting behavior. We measure the outcomes as factors of extensive behavior batteries at ages 6, 7, and 8. We measure parenting behavior as factors of extensive parenting batteries at age 5.

Early Skills as Mediators of Later Life Outcomes

Female



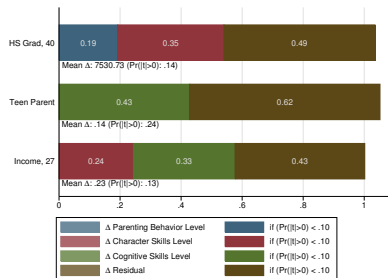
Male



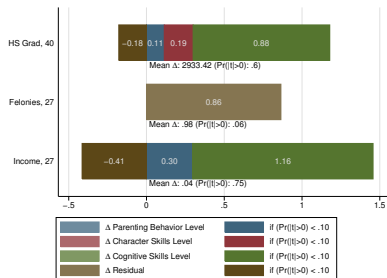
Note: this plot is a graphical display of a Laspeyres decomposition of the outcomes in the the y-axis in three different skills. Below the bar we display the mean difference in the outcome. Then, we decompose the length of these changes, which we normalize to one, in the experimentally induced treatment effects in skills. All the outcomes are at age 30. We measure skills based on extensive behavior and intelligence measures at ages 6, 7, and 8.

Early Skills and Parenting as Mediators of Later Life Outcomes

Female



Male



Note: this plot is a graphical display of a Laspeyres decomposition of the outcomes in the the y-axis in three different skills. Below the bar we display the mean difference in the outcome. Then, we decompose the length of these changes, which we normalize to one, in the experimentally induced treatment effects in skills and parenting behavior. All the outcomes are at age 30. We measure character skills based on extensive behavior measures assessing openness to experience, conscientiousness, extraversion, and emotional stability at ages 6, 7, and 8. We measure cognitive skills through IQ. We measure parenting behavior as factors of extensive parenting batteries at age 5.

Heckman, J. J., S. H. Moon, R. Pinto, P. Savelyev, and A. Yavitz
(2010). Analyzing Social Experiments as Implemented: A
Reexamination of the Evidence from the HighScope Perry
Preschool Program. *Quantitative Economics* 1(1), 1–46.