The Long-Term Impact of the Head Start Program

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A growing body of rigorous evidence suggests that policy interventions aimed at early childhood bear fruit for decades. For example, reductions in air pollution in the first year of life and more experienced kindergarten teachers are associated with increases in later earnings, while childhood access to food stamps and Medicaid causes better health in adulthood. Across many studies of several programs, preschool attendance among disadvantaged children has been found to positively impact participants. Research has demonstrated strong long-term impacts of random assignment to high-quality preschool programs from the 1960s and 1970s, including Perry Preschool and the Abecedarian program. Head Start, the large-scale federal preschool program, has also been shown to improve post-preschool outcomes, including high school completion and health outcomes.

In this Economic Analysis, we investigate the impact of Head Start on a new set of long-term outcomes, extending landmark analyses further into adulthood and considering the effect of Head Start on participants' children.[i] Among the key takeaways of the analysis are:

- Consistent with the prior literature, we find that Head Start improves educational outcomes—increasing the probability that participants graduate from high school, attend college, and receive a post-secondary degree, license, or certification.
- Overall and particularly among African American participants, we find that Head Start also causes social, emotional, and behavioral development that becomes evident in adulthood measures of self-control, self-esteem, and positive parenting practices.
- We find that Head Start participation increased positive parenting practices for each ethnic group and for participants whose mothers did not have a high school degree when compared with the outcomes of children who went to a preschool other than Head Start.

This study uses data from the National Longitudinal Survey of Youth (NLSY), a multiple-generation longitudinal survey with data on a wide range of important developmental, economic, and social topics. The NLSY began as a nationally representative sample of almost 13,000 men and women in 1979. Every child of the women in the NLSY is inducted into a second generation sample; almost 10,000 children have been interviewed at least once since 1986. When these second-generation respondents had children, they were interviewed about the third generation. These second-generation respondents are surveyed biennially until age thirty, and are subsequently surveyed every four years.

We adopt a standard, well-established method to identify the effect of Head Start, comparing children who went to Head Start with their siblings who either went to a different type of preschool or who did not attend any program.[ii] This approach allows us to avoid comparing individuals across different families whose dissimilar characteristics and experiences make it difficult to isolate the effect of Head

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Start. Instead, we adopt the approach preferred in the research literature in the absence of an experiment: comparing one sibling to another, effectively controlling for differences between families that are fixed. When siblings attend different types of preschool (or none at all), this approach allows us to compare the impact of Head Start attendance both to attending a preschool other than Head Start and to attending no preschool at all.

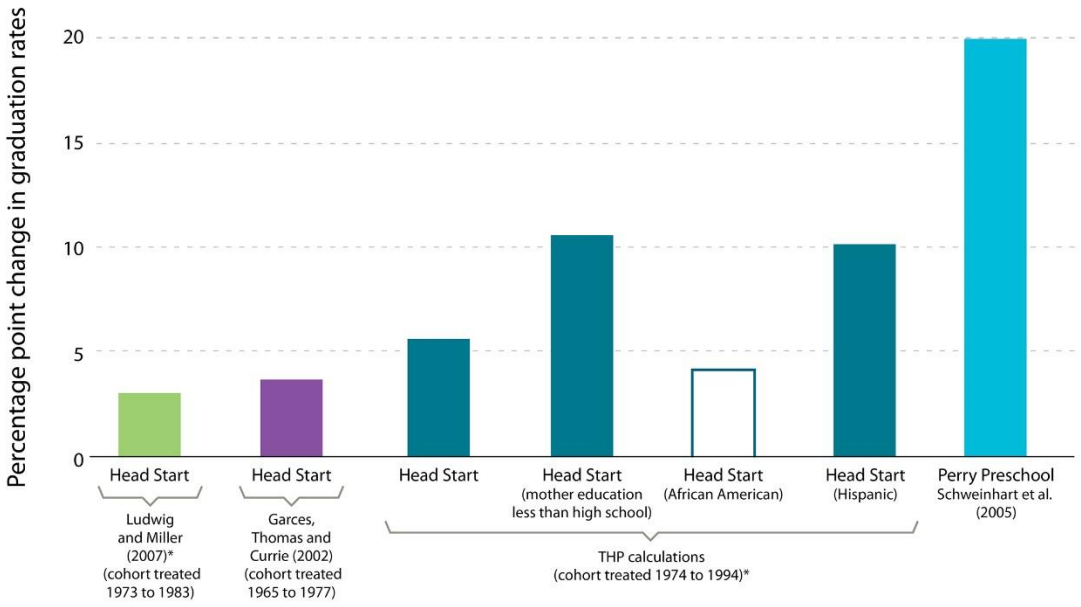
Because we do not have information about why some siblings attended Head Start and some did not, an important criticism of this method concerns the conditions under which it is appropriate to compare siblings. For example, if the sibling who attended Head Start was more likely to be the youngest child in the family, or was preschool age when the family had an unusually low income, or was enrolled in Head Start because the parents had concerns about the child's development, then the measured effect of Head Start may be confounded with these other factors. To assess how likely these other factors are to confound the estimates, previous studies have used available information about children, their mothers, and their families prior to attending preschool, to directly test whether these characteristics predict participation in Head Start.[iii] Implementing this test, we find that a wide variety of characteristics of the children, mothers, and households prior to enrollment do not predict whether a child enrolls in Head Start, preschool, or nothing at all (see the Appendix for details). This is evidence that our so-called quasi-experimental study design—comparing siblings who go to Head Start with those who did not—yields valid estimates of the causal effect of Head Start. Nonetheless, we cannot rule out the potential that unobserved characteristics influence which sibling attends Head Start and confound the estimated effect.

Using this approach, we investigate Head Start's impact on both its participants and their children, including participants' high school graduation rates; enrollment in and completion of higher education; social, emotional, and behavioral development; and how attendance in Head Start impacted participants' subsequent parenting practices.

Evidence demonstrates that early childhood education interventions have positive impacts on high school graduation rates. Figure 1 shows that early childhood education programs—whether Head Start or a model program like Perry Preschool—cause increases in high school graduation rates more than a decade later. Perry Preschool increases high school graduation by 20 percentage points, while the estimates of Head Start's impact are more modest. Our analysis—extending work done by David Deming of Harvard—shows that more recent cohorts of Head Start saw a slightly larger impact than earlier cohorts, and that the program had different impacts across different subgroups. For example, Hispanic children and children of mothers who did not have a high school credential were helped more by Head Start.[iv]

FIGURE 1.

Effect of Early Education on High School Graduation Rates



Note: Hollowed bars are not statistically significant at the 10 percent level. *Estimate for Ludwig and Miller (2007) may include and THP calculations do include some GED completers, but authors estimate their contribution to the total is small. There is no differential effect for white students. See the technical appendix.

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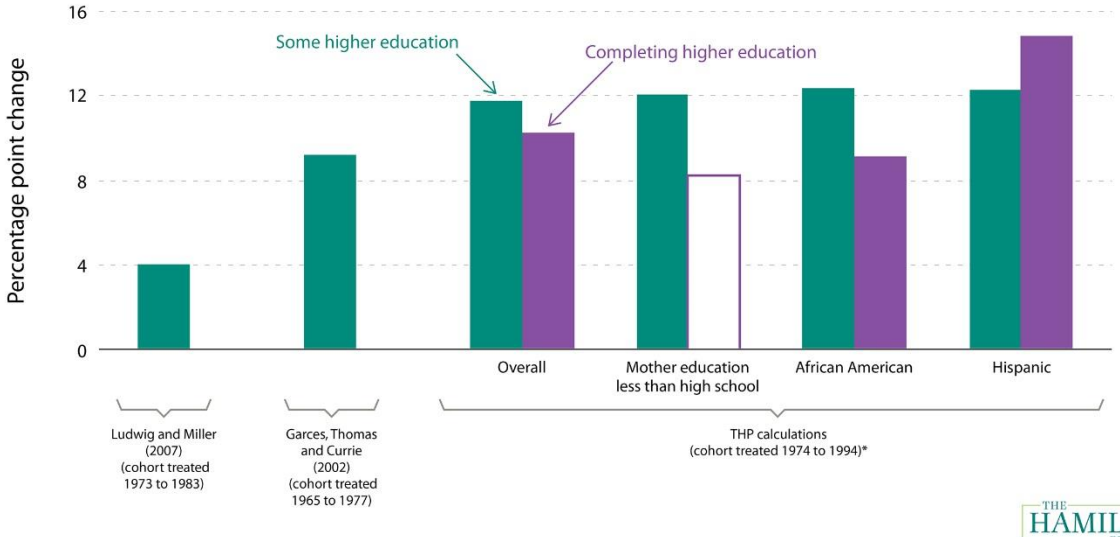
Participation in Head Start also increases a student's chances both of pursuing and completing higher education. In Figure 2, we display and report estimates from two prior published studies of the effect of Head Start on postsecondary education, followed by our calculations from more recent data, again building on Deming's work. We find that the likelihood of pursuing some higher education is increased between 4 and 12 percentage points by Head Start.[v] We further estimate the effect of Head Start not only on postsecondary education but also on completion of a post-secondary credential, defined to include a license or certificate, an associate's degree, or a bachelor's degree. Head Start increases postsecondary credential completion overall, including an estimated increase of 15 percentage points for Hispanic participants.

FIGURE 2.

Impact of Head Start on Higher Education



Note: Hollowed bars are not statistically significant at the 10 percent level. There is no differential effect for white students. *THP calculations include post-high school receipt of licenses and/or certificates in addition to postsecondary degrees.

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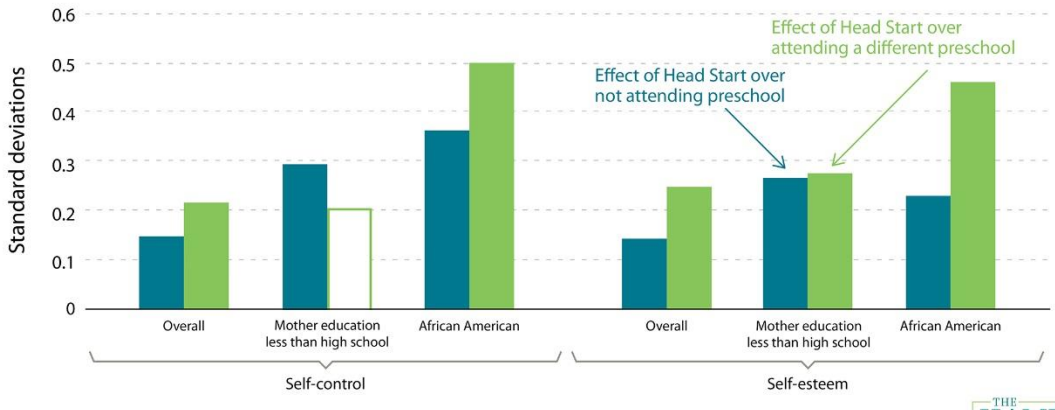
There is an increasing understanding that improvements on behavioral measures have positive effects on a variety of economic and social outcomes. In light of this, we study the impact of Head Start on measures of social, emotional, and behavioral development including self-control, self-esteem, and parenting practices—outcomes that to our knowledge have not been previously studied in this framework. To measure the effect of Head Start on self-control, we create an index of three scales that measures planning, problem-solving, and behavior-monitoring.[vi] As shown in the left panel of Figure 3, we find that attending Head Start increases students' self-control by 0.15 standard deviations relative to not attending preschool. The impacts are twice as large for African American participants. Children of mothers without a high school degree also saw significant gains from Head Start, but only relative to siblings who did not attend preschool.

FIGURE 3.

Impact of Head Start on Self-control and Self-esteem



Note: Hollowed bars are not statistically significant at the 10 percent level. There is no differential effect for white or Hispanic students.

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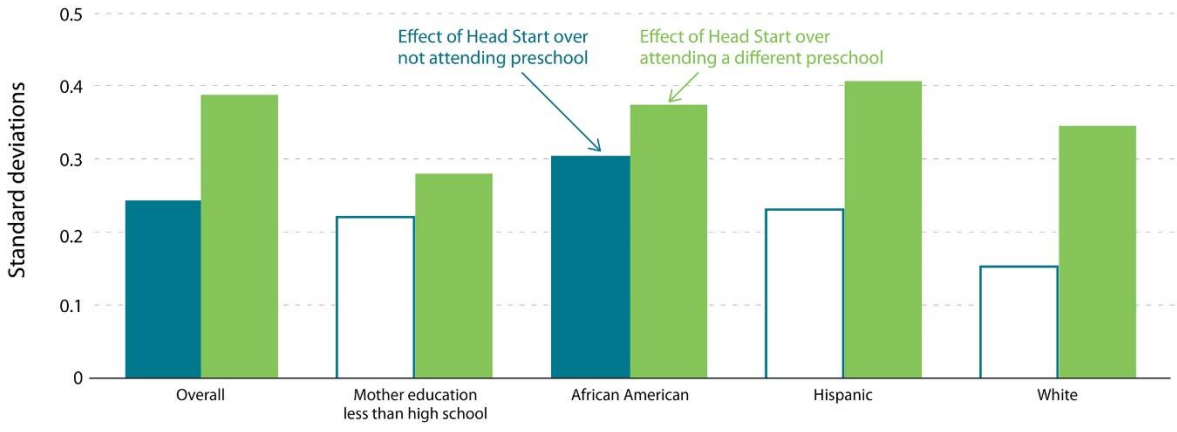
Head Start also contributes positively to participants' self-esteem, as shown in the right panel of Figure 3. Across the whole sample, we find that attending Head Start increases later reported self-esteem by 0.14 standard deviations. These gains were especially prominent for African American students, as well as for those whose mothers did not complete high school when compared to siblings who did not go to any preschool.[vii]

Finally, we look at the effect of Head Start on the next generation through its impact on parenting practices.[viii] While Head Start has been shown to change the behavior of parents while the child is attending the program (see recent work by Gelber and Isen), nothing had been known about whether the program causes participants to change their behavior toward their own children decades later.

We find that Head Start causes participants to invest more in their own children years after their participation in the program. To measure these investments, we developed an index of positive parenting practices incorporating the frequency of a parent reading aloud to their child; whether the parent reported teaching their child numbers, the alphabet, colors, and shapes at home; whether the parent reported in the past week praising the child, showing physical affection, and spending time with the child doing one of the child's favorite activities; and whether the parent reported not spanking the child in the past week.[ix] As shown in Figure 4, across all subgroups studied, parenting practices were improved relative to siblings who attended non-Head Start preschool programs. Results were more mixed when Head Start attendees were compared to siblings who did not attend preschool, with statistically significant impacts overall and for African Americans but not for Hispanics, whites or children of mothers with less than a high school education.

FIGURE 4.

Impact of Head Start on Positive Parenting



Note: Hollowed bars are not statistically significant at the 10 percent level.

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There are two issues of note regarding the social, emotional, and behavioral analyses:

- For each of the behavioral development analyses, the estimates of the effect of Head Start is larger when compared with their siblings who went to a different preschool than when compared with a sibling who did not attend preschool. While these data do not have measures

of center quality, this finding does suggest that the preschool alternatives were of poorer quality than a seat in Head Start.

- Although there are strong impacts of Head Start on Hispanics' educational outcomes (as shown in Figures 1 and 2), we find no statistically significant impact of Head Start on their measured self-control or self-esteem. Because the sample size is smallest for Hispanics, small effects would be difficult to observe. Regardless, more research is needed to better identify and understand these patterns.

The research literature is increasingly documenting that experiences during childhood can profoundly influence later-life outcomes, and that interventions during childhood can generate cost-effective improvements in life circumstances. This economic analysis extends what we know about the long-term impacts of Head Start, thereby contributing to the current debate about preschool policies. We find that Head Start not only enhances eventual educational attainment, but also has a lasting positive impact on behavioral outcomes including self-control and self-esteem. Furthermore, it improves parenting practices—potentially providing additional benefits to the next generation.

Appendix

As described in the text, in this analysis we compare siblings who went to Head Start with those who went to a different type of preschool and those who did not attend any program. The Appendix Table below shows a series of descriptive statistics. First, in the left panel we show how Head Start children are different from other children when compared across different families—an approach not taken in this analysis. Consistent with Head Start's mission to serve disadvantaged children, those who attend Head Start score significantly lower across a series of household characteristics including income, the quality of the home environment, and how many adults were in the household. They also have worse child-specific characteristics, including measures of birth weight and early childhood health.

In the right panel, we show descriptive statistics across siblings by their preschool attendance—that is, the approach taken in this study. Here we find small and not statistically significant differences across siblings. In other word, the sibling who attended Head Start was not systematically more (or less) disadvantaged in terms of measures of birth weight and early childhood health, nor did the mother or family exhibit different time-varying characteristics (such as educational attainment, or income level) when the Head Start participant was a child. This is strong evidence that the study design employed here is valid.

The bottom panel repeats the exercise with the children of the siblings impacted by Head Start, again finding strong cross-family differences but small and insignificant differences when the between-sibling comparison is done.

APPENDIX TABLE 1.

Predicting Selection into Head Start or Preschool Across and Within Families Based on Observable Characteristics

		Pretreatment Characteristics							
		Selection across Families				Selection within a Head Start Family			
		Overall	Child	Mother	Household	Overall	Child	Mother	Household
Long-Term Outcome Sample	Head Start	-0.207***	-0.179***	0.001	-0.268***	0.051	-0.032	0.054	0.018
		(0.044)	(0.042)	(0.047)	(0.045)	(0.060)	(0.078)	(0.070)	(0.058)
	Preschool	0.563***	0.248***	0.458***	0.513***	0.064	-0.035	0.123	0.010
		(0.041)	(0.039)	(0.042)	(0.042)	(0.098)	(0.138)	(0.107)	(0.084)
Second Generation Sample	Head Start	-0.270***	-0.277***	-0.039	-0.179***	0.039	0.063	0.061	-0.032
		(0.068)	(0.068)	(0.072)	(0.042)	(0.090)	(0.115)	(0.103)	(0.078)
	Preschool	0.401***	0.333***	0.369***	0.248***	0.078	0.051	0.214	-0.035
		(0.065)	(0.072)	(0.064)	(0.039)	(0.153)	(0.145)	(0.141)	(0.138)

Note: For the long-term outcome sample, the sample size is 3,770 individuals for the selection across families estimate and 1,439 individuals in 666 families for the selection within the Head Start families estimate. For the second generation sample, the sample size is 1,450 for the selection across families estimate and 617 individuals in 300 families for the selection within the Head Start families estimate.

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[i] The sample is limited to those respondents who were aged 28 or above in their most recent sample year and who did not attrite after the 2010 survey year. The sample is not restricted by age at response for the dependent variables. For the index of self-control as well as the self-esteem measure, the most recent response was taken and for the education outcomes and parenting index, the highest values across the survey waves were used. Birth year fixed-effects are used in each specification and age at response is additionally controlled in the self-control and self-esteem regressions. Each regression also controls for gender and pretreatment characteristics, for which missing values were imputed.

[ii] Using this dataset, this method was used by Currie and Thomas and Deming. Alternatively, Carneiro and Ginja use variance in program eligibility rules to identify the effect of Head Start.

[iii] To test whether there is bias arising from the differential treatment of siblings or from time-varying characteristics of the mother and family, Head Start and other preschool participation are regressed on indices of child, maternal, and household pretreatment characteristics (Table 1). If there is no relationship between child, maternal, and household characteristics and treatment condition, then it is less likely that estimates of Head Start's impact are biased. These pretreatment characteristics are based on David Deming's Head Start paper. The child characteristics include the child's log birth weight, birth order, gender, age, whether the child had a premature birth, whether the child was breastfed, whether the child had a preexisting health condition, whether the child had an illness in the first year of life, whether the child had regular visits to a doctor or had been to a dentist, and whether the child had private health insurance or Medicaid from ages 0–3. The household characteristics include the HOME score, a measure of the quality of a child's household environment from ages 0–3; whether the father or grandmother were present in the household from ages 0–3; and whether the child was in maternal, relative, or nonrelative child care from ages 0–3. The maternal characteristics include log income from when the child was ages 0–3 and additionally at age 3, the mother's average hours worked in the year before birth and through age 1, whether the mother smoked or drank alcohol before the child's birth, what weight change she experienced during pregnancy, and whether she breastfed the child. Estimates will be biased if the differential treatment of children by parents or maternal or family characteristics that change over time are related to participation in Head Start, and these characteristics are also related to the outcome. See Appendix Table 1 for the results.

[iv] These results are very similar to those by Deming (2009), who calculated high school graduation rates on the more limited cohorts that were available when he conducted his work. We also calculate impacts for a wider variety of subgroups.

[v] For comparison, the Project STAR class size reduction experiment raised college attendance by 7.4 percentage points among students in high-poverty schools randomly assigned to small classes in grades K-3.

[vi] Each scale is standardized by year and then given equal weight in a restandardized index for each respondent. See footnote i. for regression specifications. The Pearlin Mastery Scale measures the degree to which respondents see themselves as having agency. The Risk-Taking Behavior Scale measures attitudes toward self-control and risk-taking. The Schieman Anger Scale asks how frequently in the past week the respondent has felt out-of-control or angry.

[vii] This is broadly consistent with prior work by Carneiro and Ginja, who use a regression discontinuity design and find that Head Start led to a reduction in symptoms of depression among males between the ages of 16 and 17 as measured by the Center for Epidemiologic Studies Depression Scale (Depression Scale), though we found null results for the effect of Head Start on this Depression Scale at older ages.

[viii] We resample to identify families where at least two siblings are over the age of 28 and have had at least one child.

[ix] The index is created from respondent answers to questions only about their first child. The gender of the child is controlled for in the model. 97 percent of respondents reported teaching their child the alphabet, shapes, numbers or colors, while 99 percent of parents reported in the past week praising, showing physical affection, or doing the child's favorite activity, and 53 percent reported spanking the child in the past week.